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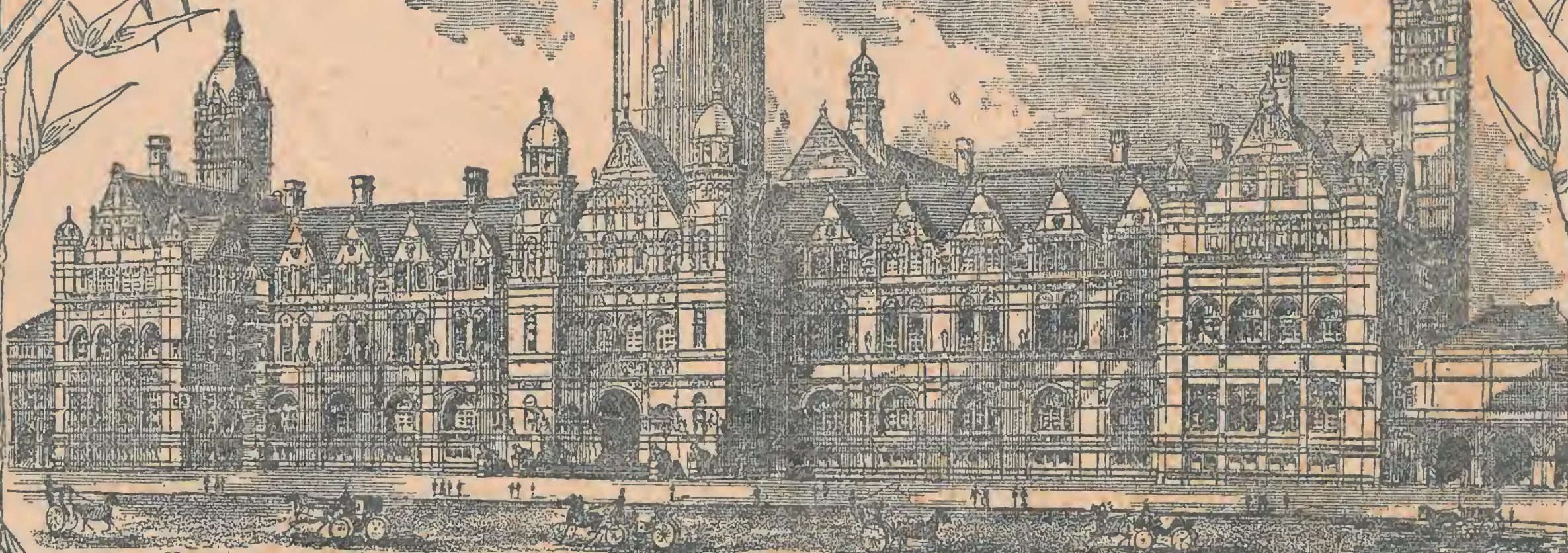
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THE COMMERCIAL COLLECTIONS OF THE INSTITUTE. BRITISH AFRICA.

(*West Central Lower Gallery.*)

CAPE COLONY.

Representative Governors.—The Hon. SIR DAVID TENNANT, K.C.M.G.
[ONE VACANCY.]

Corresponding Agent in Colony.—(At present through the Agent-General's Office.

Curator of Collection.—Mr. LEWIS ATKINSON.

Products Exhibited.—Agricultural produce, building stones, coal dried fruits, furs minerals (including asbestos, gold-bearing quartz, copper ores, diamondiferous gravel etc.), stuffed ostriches, ostrich eggs and feathers, Angora hair, tobacco, wines, wools, etc

NATAL. (*West Central Lower Gallery*)

Representative Governor.—SIR WALTER PEACE, K.C.M.G.

Corresponding Agent in Colony.—Mr. C. B. LLOYD, Commissioner of Agriculture and Mines, Natal.

Curator of Collection.—(In charge of Institute Staff.)

Products Exhibited.—Agricultural produce, Angora hair, tanning barks, building stones, coffee, cutlery, indigenous timbers, minerals, coal, silk cocoons, spirits, sugar, tea, tobaccos, wine, wools, native ornaments, etc., etc.

RHODESIA AND BECHUANALAND.

(*West Central Lower Gallery.*)

Representative Governors.—Those of CAPE COLONY.

Curator of Collection.—Mr. LEWIS ATKINSON.

Products Exhibited.—Specimens of native workmanship kindly lent by the late

NYASSALAND, BRITISH CENTRAL AFRICA.

(*West Central Lower Gallery.*)

Products Exhibited.—(By the British Central Africa Chamber of Agriculture and Commerce).—Coffee, ivory, *Landolphia* rubber, chillies, *Strophanthus* seeds, beeswax, photographs, etc.

BRITISH AMERICA.

(*West and Upper West Central Galleries.*)

DOMINION OF CANADA.

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Corresponding Agent in Province.—The COMMISSIONER OF AGRICULTURE.

Products Exhibited.—Canadian furs from Hudson's Bay Co., stuffed birds, wood pulp, slates, vehicles, minerals (asbestos, apatite, mica, plumbago, etc.), agricultural produce, fruits, tobacco, maple sugar, timber, Indian ornamental work, cotton, linen, and leather, and iron manufactures.

THE COMMERCIAL COLLECTIONS OF THE INSTITUTE—*continued.*BRITISH AMERICA—*continued.*DOMINION OF CANADA—*continued.*

PROVINCE OF ONTARIO.

Representative Governors.—SIR HENRY TYLER and JOHN PATON, Esq.

Corresponding Agent in Province.—Mr. ARCHIBALD BLUE, Director of Mines, Toronto.

Products Exhibited.—Agricultural produce, preserved fruits, indigenous timbers, gold, silver, iron, lead, and nickel ores, petroleum, marble, granite and decorative stones, coal, native wines, honey, canned meats, and woodwork.

PROVINCE OF BRITISH COLUMBIA.

Representative Governor.—The Hon. FORBES GEORGE VERNON.

Corresponding Agent in Province.—(At present through Agent-General's Office.)

Products Exhibited.—Agricultural produce, coal, Douglas fir and other timbers, minerals, preserved fruit, tinned salmon, fish oils, woodwork, birds, and animals.

PROVINCE OF NEW BRUNSWICK.

Representative Governor.—C. A. DUFF MILLER, Esq., *Agent-General.*

Corresponding Agent in Province.—The PROVINCIAL SECRETARY.

Products Exhibited.—Timbers, minerals, building stones.

PROVINCE OF MANITOBA.

Representative Governor.—The Rt. Hon. the LORD STRATHCONA and MOUNT-ROYAL, G.C.M.G.

Corresponding Agent in Province.—The PROVINCIAL SECRETARY.

Products Exhibited.—Agricultural produce (including barley, beans, corn, oats, peas, rye, wheat, flour, &c.); birds, comprising ducks, grouse, partridges, snipe, etc.; heads of wapiti, cariboo, moose and other large game; specimens of native workmanship, photographs, head-dresses, clubs, arrows, beadwork, etc., etc.

PROVINCE OF NOVA SCOTIA.

Representative Governor.—JOHN HOWARD, Esq., *Agent-General.*

Corresponding Agent in Province.—(At present through Agent-General's Office.)

Products Exhibited.—Minerals, samples of iron ore and products manufactured from the ore, wood-wool.

NORTH-WEST TERRITORIES.

Representative Governor.—THOMAS SKINNER, Esq.

Corresponding Agent in Province.—(At present through the Representative Governor.)

Products Exhibited.—Grain.

NEWFOUNDLAND.

(Upper West Central Gallery.)

Representative Governor.—[VACANT.]

Corresponding Agent.—

Products Exhibited.—Minerals (including ores of iron, copper, manganese, chromium, lead, antimony and zinc, molybdenite, mispickel, mica, asbestos, steatite, granite, marble, slate, coal, and petroleum) and timber.

BERMUDA.

(Middle of Central Lower Gallery.)

Representative Governor.—Gen. SIR ROBERT BIDDULPH, G.C.B., G.C.M.G.

Corresponding Agent.—THE COLONIAL SECRETARY.

Products Exhibited.—Arrowroot, woods, silk, shell-work, and sandstone.

WEST INDIES.

(West Central Lower Gallery.)

BRITISH GUIANA, TRINIDAD, AND TOBAGO.

Representative Governor.—The Rt. Hon. the LORD STANMORE, G.C.M.G.

Corresponding Agent.—Trinidad and Tobago: THE COLONIAL SECRETARY.

Curator of Collection.—(In charge of Institute Staff.)

Products Exhibited.—Arrowroot, cereals and pulses, medicinal barks, cocoa, coral, coffee, indigenous timbers, lace, fibres, rum, spices, starches, sugars, timber, leather, skins, drugs, fish glue, basket-work, condiments, etc.

JAMAICA AND BAHAMAS, WINDWARD ISLANDS, AND BARBADOS.

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Corresponding Agent.—Jamaica: THE INSTITUTE OF JAMAICA.

Hon. Curator.—[VACANT.]

Products Exhibited.—Arrowroot, barks, cocoa, coral, coffee, indigenous timbers, lace-bark, fibres, rum, spices, starches, sugars, sarsaparilla, wax, oils, condiments, turtle, etc.

BRITISH HONDURAS.

Representative Governor.—J. McMURRICH CURRIE, Esq.

Corresponding Agent.—[VACANT.] *Hon. Curator of Collection.*—J. M. CURRIE, Esq.

Products Exhibited.—Banana and cassava meal, cocoanut oil, coffee, horns (deer), indiarubber, Indian corn, medicinal barks, pickles, preserved fruits, rice, rope and cordage of native manufacture, rum, seeds edible and ornamental, spices, sponges, sugar, mahogany and other timbers, tobacco, etc.

LEEWARD ISLANDS.

Representative Governor.—[VACANT.]

Corresponding Agents.—Grenada: THE COLONIAL SECRETARY.

St. Vincent: THE ADMINISTRATOR. *St. Lucia:* MR. T. H. DIX.

Products Exhibited.—Arrowroot, barks, cocoa, coral, coffee, indigenous timbers, fibres, rum, spices, starches, sugars, etc., etc.

FALKLAND ISLANDS. (Middle of Central Lower Gallery.)

Representative Governor.—Gen. SIR ROBERT BIDDULPH, G.C.B., G.C.M.G.

Corresponding Agent.—THE COLONIAL SECRETARY.

Products Exhibited.—Wool, birds' skins and eggs.

BRITISH AUSTRALASIA.

NEW SOUTH WALES.

(East Central Upper and Lower Galleries.)

Representative Governor.—The Hon. HENRY COPELAND (*Agent-General*), and SIR DANIEL COOPER, Bart., G.C.M.G.

Corresponding Agent in Colony.—(At present through Agent-General's Office.)

Products Exhibited.—Minerals (including gold, silver, coal, &c.), wool, indigenous timbers, wines, cereals, seeds, gums, resins, oils, fibres, rope, leather, tallow, etc., etc.

VICTORIA.

(East Central Upper and Lower Galleries.)

Representative Governors.—JOHN PATERSON, Esq., and HOWARD SPENSLEY, Esq.

Corresponding Agents in Colony.—(At present through Agent-General's Office.)

Officer in Charge of Collection.—Mr. A. G. BERRY (of the Agent-General's Office.)

Products Exhibited.—Animals, birds, coal, cereals, chemical manufactures, cigars, essential oils, gums, grain, hops, indigenous timbers, leather, leatherware, minerals (including auriferous quartz, coal, kaolin, etc.), models of gold nuggets, seeds, sugar, tobacco, wines, wool, etc., etc.

SOUTH AUSTRALIA.

(East Central Lower Gallery.)

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Corresponding Agent in Colony.—(At present through Agent-General's Office.)

Officer in charge of Collection.—Mr. EDMUND SNELL (of the Agent-General's Office.)

Products Exhibited.—Agricultural produce, wines, indigenous timbers, furniture, wool, etc.

QUEENSLAND (AND BRITISH NEW GUINEA).

(East Central Lower Gallery.)

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Corresponding Agent in Colony.—(At present through Agent-General's Office.)

Curator of Collection.—(In charge of Institute Staff.)

Products Exhibited.—Building stones, eucalyptus oils, fibres, minerals, pearl shells, indigenous woods, cereals, models of fruits, sugar, wine, tinned meats, hides, skins, leather, etc., etc.

WESTERN AUSTRALIA. (East Central Lower Gallery.)

Representative Governor.—The Hon. H. B. LEFROY (*Agent-General*).

Corresponding Agent in Colony.—(At present through Agent-General's Office.)

Curator of Collection.—(In charge of Institute Staff.)

Products Exhibited.—Wools, gums and resins, olive oil, fibrous barks, silk, skins, indigenous woods, minerals, model gold ingots, etc., etc.

TASMANIA. (East Central Lower Gallery.)

Representative Governor.—The Hon. ALFRED DOBSON (*Agent-General*).

Corresponding Agent in Colony.—Mr. T. C. JUST, Chief Secretary's Office, Hobart.

Curator of Collection.—(In charge of Institute Staff.)

Products Exhibited.—Cereals, minerals, models of fruits, stuffed fish, furs, timbers, illustrations of local manufactures, etc., etc.

NEW ZEALAND. (East Central Lower Gallery.)

Representative Governors.—The Hon. W. P. REEVES (*Agent-General*), and THOMAS MACKENZIE, Esq. *Corresponding Agent in Colony.*—(At present through Agent-General's Office.) *Curator of Collection.*—(In temporary charge of Institute Staff.)

Products Exhibited.—Agricultural produce, building stones, coal, Kauri gum, hemp and flax, tinned meats, wools, tobacco, Kauri and other woods, with illustrations of their application to structural and ornamental purposes; photographs, etc., etc.

FIJI. (Middle of Central Lower Gallery.)

Representative Governor.—Gen. SIR ROBERT BIDDULPH, G.C.B., G.C.M.G.

Corresponding Agent in Colony.—Hon. JOHN HILL, Suva.

Curator of Collection.—(In charge of Institute Staff.)

Products Exhibited.—Barks, fibres, copra, tea, cocoa, coffee, timbers, etc.

BRITISH INDIA (AND ASIA).

INDIA. (East Gallery and Pavilion.)

Representative Governors.—Vide p. 4.

Special Sub-Committee, in charge of the Indian Section (appointed by the Secretary of State for India in Council):—*Chairman:* Major-General SIR OWEN TUDOR BURNE, G.C.I.E., K.C.S.I.

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Channel of Correspondence.—THE REVENUE AND AGRICULTURAL DEPARTMENT, INDIA.

Curator of Collection.—Mr. J. R. ROYLE, C.I.E.

Products Exhibited.—Fodder grasses, foods and food stuffs, sugar, spices and condiments, models of fruits, narcotics (including opium, ganja, etc.), tobacco and cigars, tea and coffee, oils and oil-seeds (including those of castor, sesamum, linseed, cocoa-nut and ground nut, etc.), a large assortment of drugs, dyes and tans, gums and resins (including the resins and turpentine of Indian pines, wax, lac, etc.), an extensive collection of fibres (including cotton, silk, jute, coir, rhea, agave, etc.), models illustrating the manufacture of cotton and jute, minerals (including building stones, coal, mica, soapstone, corundum, iron ores, steel, etc.), timbers, collection of Indian pottery, carved woodwork, silver, brass and copper ware, silk and cotton fabrics.

CEYLON. (East Gallery.)

Representative Governor.—The Rt. Hon. the LORD STANMORE, G.C.M.G.

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Curator of Collection.—Mr. J. R. ROYLE, C.I.E.

Products Exhibited.—Cereals, pulses, edible fruits, roots and grains, spices and condiments, drugs, horns, skins, pearls, shells, wax, oils, gums, resins, dyes, tans, fibres, timbers, building stones, plumbago, metallic ores, rough gems, palm products, tea, coffee, cocoa, cinchona bark, sugar, tobacco, cotton-cloth, mats, rattan and basket work, wood and ivory carving, metal-work, pottery, tortoise-shell and porcupine quill work, lacquer work, lace, etc., etc.

STRAITS SETTLEMENTS (AND JOHOR).

(East Gallery.)

Representative Governor.—SIR CECIL CLEMENTI SMITH, G.C.M.G.

Corresponding Agents.—The COLONIAL SECRETARY (*at Singapore*); The Dato JAMES MELDRUM (*for Johor*). *Curator of Collections.*—(In charge of Institute Staff.)

Products Exhibited.—Barks, canes, drugs, fibres, preserved fruits (including Singapore pine-apples), mats, silk fabrics, oils and oil-seeds, dyes and tans, gums, gutta-percha, tin ores and other minerals, teas, coffee, spices, timbers, etc., etc.

MAURITIUS (AND SEYCHELLES).

(West Central Lower Gallery.)

Representative Governor.—[VACANT.]

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Corresponding Agent for Seychelles.—The Hon. E. B. SWEET-ESCOTT, C.M.G., Administrator.

Curator of Collection.—(In charge of Institute Staff.)

Products Exhibited.—Fibres, hemp, oils, rum, seeds, sugars, tortoise-shell, vanilla beans, with specimens of native workmanship, etc., etc.

HONG KONG. (Middle of Central Lower Gallery.)

Representative Governor.—SIR WILLIAM ROBINSON, G.C.M.G.

Corresponding Agent in Colony.—The HARBOUR MASTER.

Curator of Collection.—(In charge of Institute Staff.)

Products Exhibited.—China, carved and inlaid ivory and wood-work, silver and lacquer ware, silk and cotton fabrics, drugs, paints, dyes, food stuffs, etc., etc.

BRITISH NORTH BORNEO. (West Central Lower Gallery.)

Corresponding Agent.—(At present through the British North Borneo Co.)

Curator of Collections.—(In charge of Institute Staff.)

Products Exhibited.—Timbers, rattans, coal, rice, sago, sugarcane and raw sugar, coffee, cocoa pods, pepper, tobacco, beeswax, camphor, gutta-percha, kapok fibre, dammars, cutch and gambier, hemp, honey, etc.

BRITISH POSSESSIONS (EUROPE).

MALTA, GIBRALTAR, AND CYPRUS.

(West Central Gallery.)

Representative Governor.—Gen. SIR ROBERT BIDDULPH, G.C.B., G.C.M.G.

Corresponding Agent.—(At present through the Representative Governor.)

Curator of Collections.—(In charge of Institute Staff.)

Products Exhibited.—From Malta—Carved stone-work, lace, macaroni, honey, various fabrics, models, pictures, etc., etc. Gibraltar and Cyprus—None at present.

IMPERIAL INSTITUTE JOURNAL.

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GENERAL NOTICES.

"THE IMPERIAL INSTITUTE JOURNAL."

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Communications respecting Advertisements should be addressed to the ADVERTISEMENT MANAGER, 6, Arundel-street, Strand, London, W.C.

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SPECIAL NOTICE.

MEETING OF THE GOVERNING BODY.

An important meeting of the Governing Body of the Institute, at which His Royal Highness the PRINCE OF WALES, as President, occupied the chair, was held on the 21st ult. A full report of the proceedings will appear in the next issue of this Journal.

THE FELLOWS' DEPARTMENT.

The Reading, Writing, and News Rooms, are open for the use of Fellows every week-day from 10 a.m. till 11.30 p.m., and on Sundays from 3 p.m. to 10.30 p.m. The Library (on the First Floor), is open from 10 a.m. to dusk on Week-days, and from 3 p.m. to dusk on Sundays. The Map Room (First Floor) is open from 10 a.m. to 5 p.m. on Week-days.

The Poste Restante is open every week-day for receipt and delivery of letters and parcels. Letters addressed to initials only are not received, except in reply to notices in the JOURNAL, under "Requirements" Registry. The General Post Office Pillar Box is cleared daily twelve times, between 10.10 a.m. and midnight.

Light refreshments only are, for the present, provided in the Fellows' Rooms and at the bar of the Ceylon Kiosk.

LECTURE AND CONCERT ARRANGEMENTS.

LECTURES.

The second portion of the Lecture Season will begin on Monday, 27th January, when, at 8.30 p.m., the Hon. Sir JOHN A. COCKBURN, K.C.M.G., will deliver a lecture entitled "Federal Fulfilment."

Arrangements have also been made for the delivery of the following :—
"British Columbia," by the Hon. J. H. TURNER, Agent-General for British Columbia.

"The Native Races of the Niger Territories," and "The Obstacles to Development in West Africa," by C. F. HARFORD-BATTERSBY, Esq., M.D., Principal of Livingstone College.

Further particulars with regard to these lectures, and of the fixtures for the subsequent Monday evenings of the Lecture Season, will be announced in due course.

Admission to the Lecture-Hall by the first entrance to the Imperial Institute coming from Exhibition Road.

Seats are reserved for Fellows, who have also the privilege of admitting two Friends for each Lecture, or Address, by reserved seat tickets.

CONCERTS.

The EVENING CONCERTS for Fellows and their friends will be continued during the Winter Season, 1901-2, and will take place in the JEHANGIER HALL on certain Wednesday evenings, the dates of which will be announced in due course.

The following **Concerts** will take place next month :—

Wed., 5th February, 8.30 p.m. CONCERT by the IMPERIAL INSTITUTE (AMATEUR) ORCHESTRA. *Chairman of Orchestral Committee, FRANK H. BUTLER, Esq. Hon. Leader, LOUIS H. D'EGVILLE, Esq. Hon. Conductor, A. RANDEGGER, Esq.*

The programme will include the following :—

SYMPHONY IN B MINOR (unfinished)	Schubert.
BARCAROLA ROMANTICA (For Violin and Orchestra)	A. Randegger, Junr.
Solo Violin	Mr. LOUIS H. D'EGVILLE.
OVERTURE	"Rienzi" Wagner.
JUDEX	From "Mors et Vita" Gounod.
WALSE	"Schatz" Johann Strauss.
PIANOFORTE CONCERTO, No. 2, IN G MINOR, Op. 22	Saint-Saëns.

Vocalist . . . MR. HENRY BOULDERSON.

Wed., 19th February, 8.30 p.m. CONCERT by the STUDENTS of the ROYAL ACADEMY OF MUSIC, under the direction of Sir ALEXANDER C. MACKENZIE, Mus. Doc., LL.D., F.R.A.M.

Fellows have *free* admission to the Concerts, and can purchase tickets (at 2s. 6d. each) for the admission of their Friends.

THE SCIENTIFIC AND TECHNICAL DEPARTMENT.

The Scientific and Technical Department of the Institute has been established to acquire information by special enquiries and by experimental research, technical trials and commercial valuation regarding new or little known natural or manufactured products of the various Colonies and Dependencies of the British Empire and of foreign countries, and also regarding known products procurable from new sources, and local products of manufacture which it is desired to export. This work is carried out with a view to the creation of new openings in trade, or the promotion of industrial developments.

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The Office of this Department, in the West Corridor, First Floor, is open daily from 10 a.m. to 5 p.m. (on Saturdays till 1 p.m.), for the purpose of answering enquiries and supplying information relating to the Commerce (Export and Import) and Industries of India and the Colonies. Applications may be made personally or by letter. Special information may be obtained from the Curators in charge of the Indian and of certain Colonial Collections. Arrangements have been made for the translation for mercantile firms of Trade Circulars, Price-Lists, and Catalogues into any Foreign Language, including the conversion of weights, measures and coinages, etc., at cost price, and application for such may be addressed to this Department.

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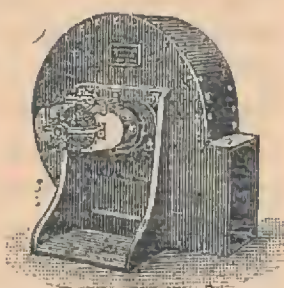
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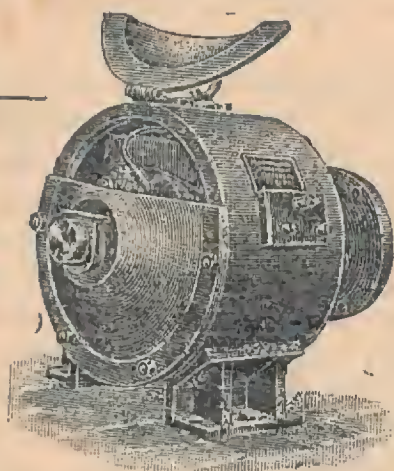
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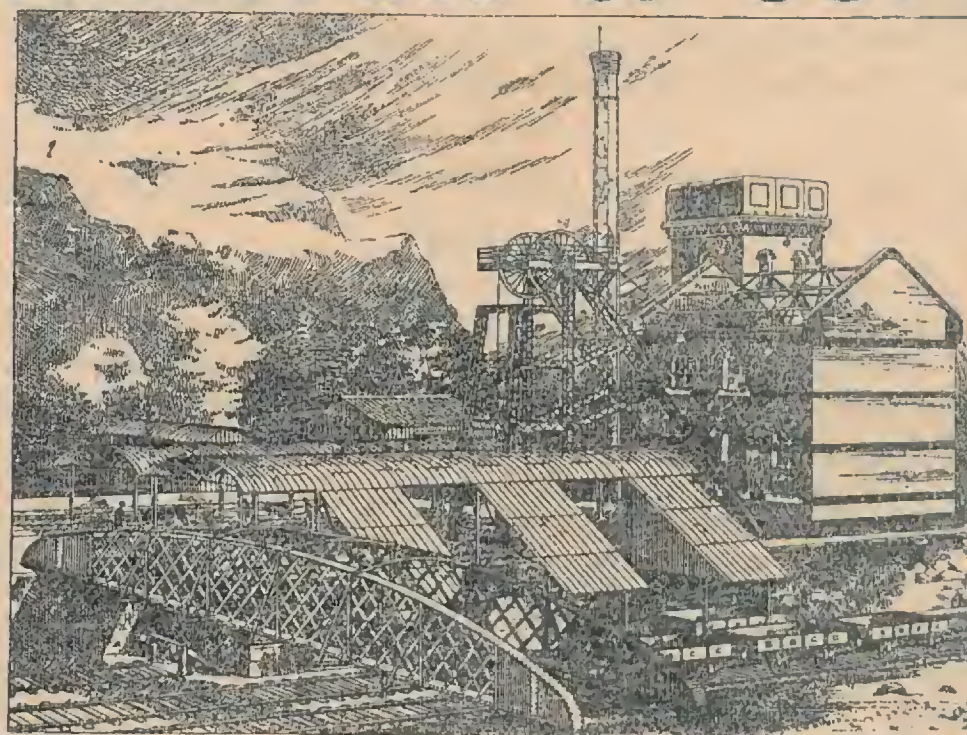
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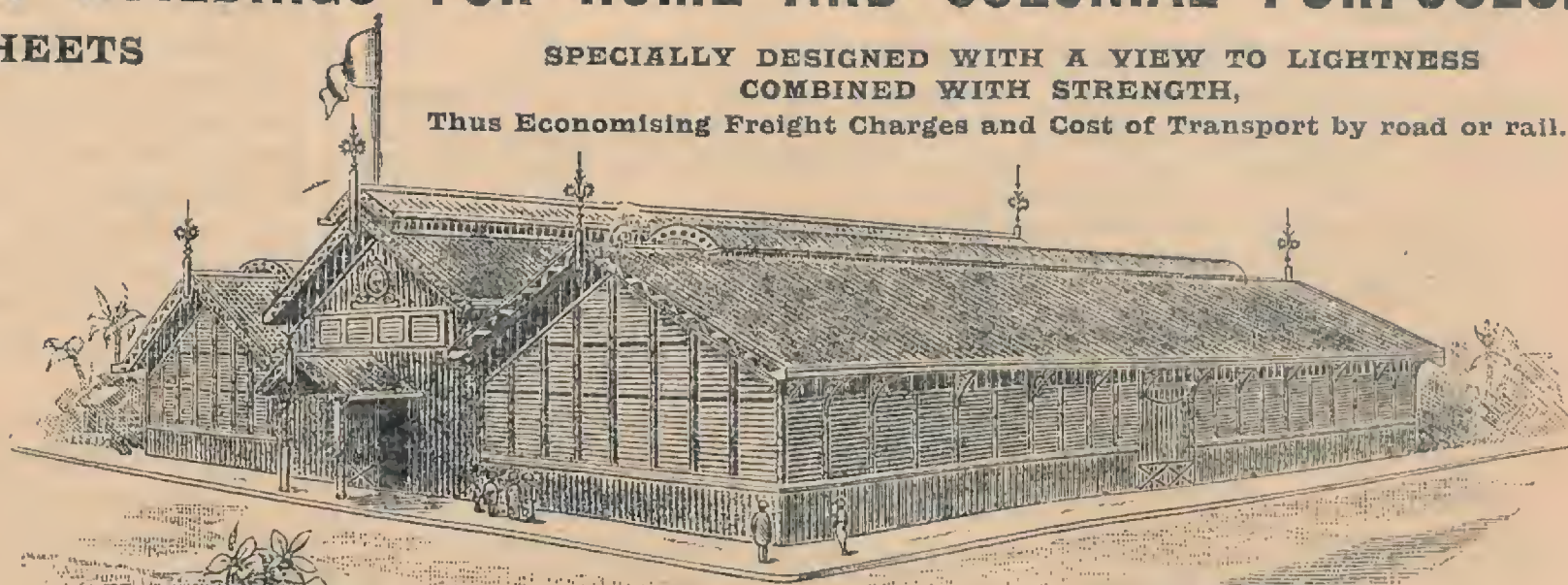
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FINANCIAL AND COMMERCIAL RETROSPECT.

UNITED KINGDOM.—The Board of Trade Returns for November record decreases both in the imports and the exports as compared with the same month of 1900, though in the re-exports of foreign and colonial merchandise, valued at £5,079,601, there was an increase of £66,346. The number of working days was the same in the two months, and the smaller figures are largely explicable by the lower prices ruling. Among the imports, which at £46,810,553 showed a diminution of £2,923,177 or 5·8 per cent., there were decreases in almost every class of article. The largest percentage increases were in living sheep and lambs for food, the number of which was nearly 2½ times greater than in November, 1900, while their value rose in almost equal proportion; in rice, the quantity of which was doubled and the value better by 83·9 per cent.; in coffee, the amount of which increased 74·7 and the value 36·1 per cent.; in hemp, which rose 46·3 in quantity and 42·7 per cent. in value; and in cheese, of which 38·2 per cent. more was received though its value only increased 19·9 per cent. In cereals, larger supplies from Roumania, the United States, British East Indies, Australasia and Canada increased the quantity of wheat by 9·1 per cent., but the value was only fractionally higher. Wheat flour was slightly less in quantity, but barley showed an important improvement owing to larger shipments from Roumania and Russia, the imports rising 31·3 in quantity and 15·4 per cent. in value. Oats improved slightly in quantity and still more so in value (15·4 per cent.), but, on the other hand, Indian corn fell off seriously—34·3 in quantity, and 24·4 per cent. in value—largely owing to the small supplies from the United States, which were only 574,800 cwt., compared with 3,397,300 cwt. in the preceding November. Refined sugar did not alter much in quantity, but its value was 13·8 per cent. less, while in raw sugar the value declined by 41·4 per cent., the quantity being less by 28·5 per cent. Tea fell off by 22·3 per cent. in amount, and 25·7 in value, while in unmanufactured tobacco there was a decline in both respects of about 4 per cent., though manufactured tobacco showed an improvement. Raw cotton rose by 255,215 cwt., but its value was less by £219,692 (2·9 per cent.); the imports were larger from Egypt, the United States and Brazil, but smaller from the British East Indies. Cotton manufactures slightly declined in value. Flax, jute, raw silk and sheep's wool were all less, the value of the last diminishing by £189,492 and its quantity by 4,695,259 lb., in spite of larger shipments from British South Africa. In hewn and sawn wood there was again a heavy falling off—31·1 per cent. in quantity, and 35·9 per cent. (nearly three-quarters of a million sterling) in value. In spite of a decrease in quantity to the extent of 8·2 per cent., copper improved slightly in value. The exports of British and Irish produce were worth £22,842,436—a decrease of £1,782,213 or 7·2 per cent. A large portion of the decrease was accounted for by the reduction in both the quantity and the price of coal. All countries, except Italy and India, took less, especially France, with the result that the exports were less by 587,431 tons (14·4 per cent), while the value fell £1,359,637 (or 37·9 per cent). In iron and steel there was a falling off in quantity of 18,303 tons (6·9 per cent.), and in value of £332,267 (or 13·4 per cent.). The value of machinery declined £203,517 (or 12·0 per cent.), although there was a slight improvement in locomotives, sewing machines, and mining machinery. In new ships built for foreigners there was a fall of £366,291. Copper increased by 32·3 per cent. in quantity, and 23·6 per cent. in value. Increased demand for cotton twist from Germany, Turkey, China, Japan and the British East Indies increased the quantity by 28·6 per cent., but the value was only better by 12·4 per cent. In cotton piece-goods there was an increase of nearly 16 million yards; India took less, but China took 30 million yards, and British South Africa 3 million yards, more than in November, 1900. The fall in prices, however, was such that the value was only 1 per cent. better. In other cotton manufactures the fall in value was 4·1 per cent. Wool was 29 per cent. less in quantity, and 44·7 less in value; woollen and worsted yarns and woollen tissues were also less in both respects, though to a smaller extent, but worsted tissues increased 20·3 per cent. in amount, and 4·7 in value. Chemicals, with the exception of copper sulphate, were higher in value. Chemical manures increased 8·5 per cent. in quantity, and 9·4 per cent. in value, and soda compounds 32·8 per cent. in the former respect, and 24·7 per cent. in the latter.

In the course of last month the North Eastern Railway Company announced that, for the future, it will adopt an important innovation in the method by which its traffic statistics are compiled. Hitherto British railways have only published the number of train-miles run, and the number of passengers carried, and have not compiled, even for their own use (with one possible exception), those particulars as to the number of passengers and tons of goods carried one mile ("passenger-miles" and "ton-miles") which are furnished as a matter of course by the railways of other countries, and are generally regarded, except in Great Britain, as indispensable to the proper and economical management of a railway's traffic. Henceforth the North Eastern will be an exception to this British rule (though it may be hoped that it will not long retain this particular monopoly), and will for the future have these units regularly worked out, and will use them as the basis for the operation of the line.

COLONIES.—The report of the Customs Department of the Dominion of Canada for the year ending on June 30 last has just been issued. It states that the aggregate of the imports and exports of the Dominion in that period

was \$386,903,157, or \$5,385,921 more than in the preceding year. By far the larger portion—\$331,000,000—was with the United States and Great Britain, the share of the former being \$183,000,000, and of the latter \$148,000,000. The next countries in order were Germany, which sold about \$2,000,000 of goods to Canada and purchased over \$7,000,000; France, which purchased \$5,000,000 and sold \$1,500,000; Belgium, which purchased \$3,800,000 and sold \$2,800,000; and the West Indies, which took \$2,905,000, and sent \$1,801,000. With China and Japan the total trade was worth over \$3,000,000, with Newfoundland a little under \$3,000,000, and with Australia \$2,311,000, the great bulk of the transactions with the two latter being purchases. The percentage of duty on the total value of the goods imported was 16·06, against 15·98 in the preceding year.

The number of mines on the Witwatersrand at which resumption of working is being allowed is steadily increasing, but as yet the results scarcely seem commensurate with the number of stamps that have been started. The yield of gold for November was 39,075 oz., less than a twelfth of the highest output recorded, which was in August, 1899, just before the outbreak of hostilities. In October last it was 33,393 oz. However, there has been a distinct re-awakening of interest on the London Stock Exchange in the South African mine market, and prices have already improved generally. The Rhodesian output is slowly rising. That for November—16,487 oz.—was the highest yet recorded, being nearly two thousand ounces better than in the preceding month, and nearly six thousand ahead of the return for the first month of last year. The November yield in New South Wales was 34,293 oz., valued at £113,528—a large improvement on that for the same month of the preceding year, which was only 12,579 oz., valued at £43,587. In Victoria the output was 53,426 oz., while in West Australia 85,324 oz. were entered for export and 89,157 oz. received at the Perth Mint; this total of 174,481 oz., valued at £671,753, compares with 146,635 oz. in November, 1900. In New Zealand the yield was 39,185 oz., valued at £149,680, against 19,739 oz., valued at £70,957 in the preceding November.

The following table shows the variations which have occurred in certain Colonial Government securities during the past three months:—

	29th Oct.	28th Nov.	30th Dec.
Canada 3 per cent. . . .	100½-101½	101¼-101¾	101¼-101¾
Cape 3 per cent. . . .	93½-94½	93½-94½	95-95½
Natal 3 per cent. . . .	93½-94½	93½-94½	94-95
New S. Wales 3 per cent. . .	94½-95½	94-94½	95½-96
New Zealand 3 per cent. . .	96½-97½	93¾-94¼	94½-95
Queensland, 3 per cent. . .	91½-92½	93-93½	93¾-94¼
South Australia 3 per cent. .	92½-93½	92¾-93¼	93¼-93¾
Tasmania 3½ per cent. . .	103½-104½	103½-104½	103½-104½
Victoria 3 per cent. . . .	95½-96½	95¾-96¼	96¼-96¾
West Australia 3 per cent. (May-Nov.)	91½-92½	91½-92½	92½-93½

INDIA.—The report of the Burma Railways Company for the year ending in June last shows that the receipts were Rs. 11,632,642, against Rs. 10,062,592 in 1899-1900, while the expenditure was Rs. 6,563,241, against Rs. 5,602,901. The net revenue of Rs. 5,069,401 thus showed an improvement of Rs. 609,710. The working expenses were 56·42 per cent. of the gross receipts, against 55·68 per cent. The mileage open for traffic at the end of the financial year was 1,177 miles, and the mean mileage for the year was 1,128, against 997 in 1899-1900. The goods carried increased in weight from 1,168,178 to 2,357,567 tons.

The fluctuations which have occurred in the securities of seven leading Indian Railway Companies are shown in the subjoined table:—

	29th Oct.	29th Nov.	30th Dec.
Bengal and North Western . .	126-130	129-133	127-131
Bengal-Nagpur Gua. 4 per cent. .	104-108	105-109	106-110
Bombay, Baroda & Cent. India .	168-173	170-175	171-176
Indian Midland 4 per cent. . .	105-109	106-110	106-110
Madras Grntd. 5 per cent. . .	133-137	138-143	134-138
South Indian 4½ per cent. Deb. .	138-143	138-143	136-141
Southern Mahratta 3½ per cent. .	106-110	107-111	107-111

FOREIGN COUNTRIES.—In the German Budget Bill, as laid before the Reichstag at the beginning of last month, the estimates of revenue and expenditure balanced at 2,349,742,456 marks. The revenue, however, fell short of the expenditure by nearly 59 million marks, and to make good the deficit it was proposed to increase the matricular contributions, so as to yield 24 millions more, and to provide for the remaining 35 millions by a supplementary loan. Credit operations to the extent of 182,058,945 marks were authorised by the Bill to meet various items of non-recurring expenditure. In Italy the Treasury Minister in his financial statement could point to various signs of the increasing prosperity of the country. The Budget for the past financial year showed a surplus of income over expenditure of £1,648,000, exclusive of £300,000 spent in the redemption of debt and £720,000 devoted to railway construction, while for the current year the surplus is estimated to amount to £500,000. There are satisfactory yields in almost every branch of revenue. The floating Treasury debt has been reduced by £2,500,000 within the last three years, and the metallic reserve has been increased to 50 per cent. of the total note currency, while Consols stand at par and the gold premium has fallen to 2¼ per cent. In the Japanese Budget, the ordinary expenditure appears as 177,500,000 yen, and the ordinary revenue as 225,000,000 yen. The surplus, together with 38,000,000 yen obtained by the sale of Chinese new indemnity bonds and 15,500,000 from the old Chinese indemnity and other sources, it is proposed to devote to the redemption of national debt, building railways and telegraphs, and restoring the naval maintenance fund. These proposals, however, do not meet with universal approval, one objection urged being the inclusion of all the new indemnity in one year's revenue. The proposals put forward by the Portuguese Government for the reorganization of their debt were rejected by the Council of Foreign Bondholders. The proposals provided, among other things, for a reduction in the principal of the debt to the extent of 52½ per cent. for the 3 per cent. debt, 33½ per cent. for the 4 per cent. debt, and 25 per cent. for the 4½ per cent. debt, while for the balance new

bonds were to be issued bearing 3 per cent. interest, so that each £100 of present bonds would receive £1. 8s. 4d., £2, and £2. 5s. respectively. A French loan was issued on December 21 for 265 million francs, the amount of the indemnity payable to France by China. Professing its inability to pay the money in a lump sum, the Chinese Government has been allowed to liquidate it in 66 half-yearly payments. The French Government, for various reasons, wants to have the money in hand immediately, but instead of issuing a loan on the security of the Chinese payments, it has elected to issue an equivalent amount of new Rentes ranking with the present three per cents. But it is also desirous not to increase the total of its debt, and has therefore arranged to use the Chinese indemnity annuities to redeem an equivalent amount of existing Rente held by the savings banks; this is to be converted into annuities payable in the 33 years by half-yearly redemptions, these annuities to be taken over by the savings banks. The loan was covered something like 25 times over.

Our usual table of exchanges follows:—

	29th Oct.	28th Nov.	30th Dec.
Paris, cheques	25f. 09½c.	25f. 16c.	25f. 14c.
Berlin, sight	20m. 39½pf.	20m. 43½pf.	20m. 39½pf.
Vienna, sight	23kr. 91	23kr. 94	23kr. 91½
Amsterdam, sight . . .	12fl. 08¾	12fl. 10¼	12fl. 10¼
Madrid, sight	35ps. 60	35ps. 80	34ps.
Lisbon, sight	38½d.	38½d.	39d.
St. Petersburg, 3 months	93r. 70	93r. 85	93r. 65
Bombay, T.T.	1s. 4d.	1s. 3½d.	1s. 4d.
Calcutta, T.T.	1s. 4d.	1s. 3½d.	1s. 4d.
Hong Kong, T.T. . . .	—	1s. 9¼d.	1s. 10¼d.
Shanghai, T.T.	2s. 7¼d.	2s. 5d.	2s. 6¼d.

AGRICULTURAL RETROSPECT.

UNITED KINGDOM.—Heavy rains in the first week of December made up to some extent the deficiencies of November, and anxiety as to the water supply in country districts was set at rest. Severe frost was experienced during the week before Christmas, but there was no sign of injury to young crops, which were particularly robust for the period of growth. The effect of the frost upon the land could not have been anything but beneficial, and, in addition, the firmness of the ground facilitated the work of manuring. There was a considerably smaller area under wheat in the United Kingdom last year, according to the final returns of the Board of Agriculture, though the total yield of that cereal, as well as of barley, was practically the same as in the previous year, owing to an increased production per acre. In 1900 the yield of wheat in England was 28·4 bushels; last year it was 30·8 bushels, or slightly more than the average of ten years, which is 29·9. In Scotland the yield was much higher last year—39 bushels to the acre, against 36·4 in 1900, and an average of 37 bushels for the past ten years. The Welsh yield was 24·6 bushels to the acre, slightly more than the average. In Wales, however, as well as in Scotland, a very small area is under wheat. The barley yield last year was distinctly below the average—30·3 bushels in England against an average of 33, 29·6 bushels in Wales against an average of 30·25, but 36·3 bushels in Scotland compared with 35·7 as the average. The oat crop showed the greatest falling off, the yield being 37 bushels, or 3¼ bushels less than the average. The Chambers of Agriculture have signified their approval of the recommendations of Sir Herbert Maxwell's Committee on the use of preservatives and colouring matter in food, one of the most important of which is that all such foreign substances shall in future be excluded from milk offered for sale in this country.

The first annual report of the Department of Agriculture and Technical Instruction in IRELAND is published. It deals with the history of the Department from its establishment on April 1, 1900, until the end of March, 1901. Two principles have, it is stated, guided the Department in its policy—first, the principle of evoking and fortifying the self-reliance, enterprise, and sense of responsibility of the people; and, secondly, the principle of preventing, by a due conservation of central direction, this free play of local initiative and responsibility from leading to an indiscriminate multiplication of unrelated local schemes. The chief work done in the Agricultural Department was the formulation of the schemes for the improvement of live stock. Under the horse scheme, 298 thoroughbred and 112 agricultural stallions were offered for registration, and of these 97 and 31 respectively were placed upon the Department's register. Upwards of 1,800 free nomination tickets of £3 each were offered at 150 shows held throughout the country during March and April, and nearly 1,700 of these tickets were issued. The schemes for encouraging improvements in the breeds of cattle provided for premiums of £12 each to approved pure-bred yearling and two-year-old bulls of any breed selected by the County Committee. Loans to the amount of £2,036 have been made to 61 persons to enable them to buy good stallions and bulls. In addition, out of the funds placed at the disposal of the Live Stock Committees from the local rate and the Department's contribution, a sum of £4,276 was allocated towards awarding premiums and prizes to female stock as a further means of encouraging improvements in stock-breeding. The total amount of money ear-marked for the schemes for improvement in the breeds of sheep and swine amounted to £23,983. Cork and Mayo were the only counties which did not adopt the schemes. The Department contributed just over half the sum named, the remainder being provided out of the local rates. In addition to the preparation and promulgation of the live-stock schemes, the practical work of the

Department upon its agricultural side has been the carrying out of certain agricultural experiments and scientific investigations, with the double object of demonstrating facts regarding the manuring of land and the use of varieties of crops, which, however well known to scientists, are not generally known to the smaller farmer, and of discovering how far, if at all, these principles require modification when applied to the soils and climate of Ireland. It has been decided that, as soon as possible, one or more itinerant instructors should be appointed to give practical and technical advice in each county on tillage farming, dairying, poultry rearing, fruit cultivation, bee-keeping, and other subjects, and several counties have already appointed such instructors.

COLONIES.—The report of the Colonial Secretary of TRINIDAD for the year 1900 shows considerable prosperity in the colony, in spite of the export of sugar being the smallest for twenty years past. Cocoa is now the staple product; the area under its cultivation is nearly twice that under sugar, and is extending daily. Cocoa, however, is not, like sugar, a manufacture, and a given quantity of it represents far less expenditure on wages than is the case with sugar; but it maintains a larger number of peasant proprietors. As to the sugar industry, the old system of a boiling-house attached to each plantation has passed away; the planter is now primarily a manufacturer, and cane farmers have come into existence who do nothing but grow the cane and then sell it to the mills. The farmers are, in many cases, peasants with only a few acres cultivated by themselves and their families.

The annual report on the affairs of the LEEWARD ISLANDS records no improvement in the condition of the sugar-growing islands of Antigua, St. Kitts-Nevis, and Montserrat. Dominica, however, whose staple products are now cocoa and limes, is enjoying a steadily increasing prosperity. Much depression is felt in ANTIGUA and ST. KITTS-NEVIS, owing to the short cane-crop and the severe drought experienced. The erection of central factories as the sole hope of restoring the sugar industry of Antigua, St. Kitts-Nevis, and Montserrat, has been so fully discussed that further advocacy would appear to be but repetition. The antiquated machinery and the obsolete methods now employed in the manufacture of sugar in these islands should, years ago, have been replaced by modern factories, but, year after year, no improvement takes place, the crops become shorter, and hundreds of acres of what were formerly valuable cane lands are now thrown out of cultivation. The export of sugar for the colony in 1900 exhibited a decrease of 7,431 tons as compared with the previous year. DOMINICA's prosperity may justly be ascribed to a steady growth in the various industries and to the gradual development of the island's resources. The exports of cocoa, in particular, were double those of ten years ago, while the output of limes and their products has increased three-fold during the same period. Dominica has, for years, been the world's chief producer of lime-juice, and the area under cultivation of limes is being largely extended. Sugar has fallen to the rank of a very minor product, while the manufacture of rum is now not even sufficient for local requirements. The export of fruit is assuming considerable proportions, and the cultivation of oranges, pineapples and bananas is attracting the attention of small capitalists.

The following information relating to agriculture in QUEENSLAND is taken from the report just received of the Agricultural Department. The figures relating to wheat are very encouraging. The area under that crop for grain rose from 52,527 acres in 1899 to 79,304 acres in 1900; the quantity yielded rose from 614,414 bushels to 1,194,088 bushels; the average yield per acre from 11·70 bushels to 15·06 bushels; and the money value from £92,162 to £179,113. In 1900 only 77 acres showed signs of rust, as against 5,610 acres in 1899. It is to be noted that during the last 15 years the acreage of land under wheat in Queensland has increased sevenfold; but there is room for even greater development, as the colonists do not produce more than a third of the wheat they consume. As regards dairying, none of the agricultural pursuits in Queensland seem to have made more rapid or enduring progress. In 1900 there were at work 53 butter and cheese factories and 146 creameries, employing 595 persons. The output that year was 3,875 tons of butter and 886 tons of cheese, valued altogether at £658,177. Of that quantity of butter, 620 tons were exported, as against 517 tons in the preceding year. The allied industry of ham and bacon curing seems to be in a similar healthy condition; the exports of bacon and hams in 1899 were valued at £31,067 and in 1900 at £45,831. Turning to fruit-culture we read that, thanks to the efforts of the departmental experts, fruit-growing is being established on a satisfactory basis in Queensland. Superior and suitable varieties are being cultivated. Insect and fungus pests are being encountered with the most effective remedies. Of grapes the production increased from 3,230,627 lb. in 1899 to 3,634,949 lb. in 1900. The area under bananas increased from 5,802 acres to 6,215 acres; under oranges, from 2,324 acres to 2,882 acres; under mangoes, from 245 acres to 411 acres; under strawberries, from 87 acres to 121 acres; under apples, from 132 acres to 238 acres. The value of the exports of fruit increased from £93,187 to £104,385. In NEW SOUTH WALES the wheat crop is estimated by the Government Statistician at 19,000,000 bushels, being an average of 12·8 bushels per acre, from an area of 1,470,400 acres. This is two full bushels per acre higher than the average of the last ten years.

From the final report of the ONTARIO Bureau of Industries on the crops of 1901, it appears that all but hay were smaller than they were estimated at first, and all but barley and hay are put below average. The crop of winter wheat yielded 16,017,029 bushels, or an average of 17·4 bushels per acre compared with an average for the past ten years of 20·2. Spring wheat yielded 5,498,751 bushels, or 15·4 bushels per acre (decennial average 15·5). Barley yielded 16,761,076 bushels, or 26·3 bushels per acre (decennial average 26·1). Oats yielded 78,334,490 bushels, or 32·5 bushels per acre (decennial average 34·9). Peas amounted to 10,089,173 bushels, or 16·7 bushels per acre, and 4,632,317 tons of hay were produced, with an average of 1·81 tons per acre. The attacks of the Hessian fly had a serious effect upon the wheat crop, and injured barley to a less extent. The area of land sown with wheat in the autumn was greatly reduced, in consequence of the fear of this pest. The important apple crop of Ontario is a very small one. The final crop bulletin of the MANITOBA Government for the past year shows a total yield in cereals of 85,000,000 bushels from

an area of 3,000,000 acres sown. The yield of wheat amounts to 50,500,000 bushels, being an average of 25 bushels per acre. This is a record yield for the province. The wheat crop in the North-Western territories exceeds 15,000,000 bushels.

INDIA.—The first general report on the rice crop of Bengal, Madras, and Lower Burma, issued by the Statistical Department of the Government of India, makes the total area sown with autumn and winter rice 46,545,900 acres, or 236,300 acres more than was harvested in 1900, but 33,600 acres less than that of the crop of 1899. In Bengal, where about four-fifths of the crop is grown, a yield close to the average is anticipated for autumn and winter rice alike. In Burma some damage has been done by floods, but prospects on the whole are favourable, while in Madras, if the rest of the season proves suitable to the maturing of the crop, an average yield may be expected. Reports from the cotton-growing districts of India, though not unfavourable, are not so good as for the same period last year. In the Punjab the area sown is now estimated at 1,074,100 acres, or about 12 per cent. below the exceptionally large area of last year. In the North-Western Provinces and Oudh the area sown is estimated at about 5 per cent. below the normal. In the Central Provinces 1,007,857 acres have been sown, an area considerably above the average. The crop is generally backward, but the out-turn is expected to be only a little short of the normal. The area under cotton in Berar is reported to be 2,628,000 acres, which is 6 per cent. in excess of last year's estimate, and 17 per cent. above the average of the last five years. In Bombay there are 1,101,500 acres under the early crop in the Deccan, this being 4 per cent. below the average. The areas in the other provinces are reported as follows:—Sind, 87,000 acres, or 7 per cent. below the average; Madras, 464,500 acres, or quite 25 per cent. below the average; and Burma, 108,712 acres.

FOREIGN COUNTRIES.—A report issued by the Ministry of Agriculture of ARGENTINA estimates the area of the wheat crop at 3,296,066 hectares, or 8,141,283 acres, as compared with 8,347,980 acres for last year, showing a decrease of 206,697 acres. These figures represent the area sown, on much of which, this season, the crop has been destroyed. Probably the total is an outside estimate, as, according to the *Standard*, the Provincial Agricultural Department of Buenos Ayres, in a report issued to counteract pessimist statements, puts the area in that province at 61,105 acres less than is given in the account published by the Central Ministry of Agriculture. In examining the returns of agricultural exports from the Argentine Republic in the first nine months of 1901, and comparing them with the figures for the corresponding periods of the two preceding years, it is seen that, over the three periods, live cattle and live sheep have been exported from the River Plate in continually decreasing quantities, while the exports of frozen mutton, frozen beef, and butter have undergone continuous expansion. Comparing the first three quarters of 1901 with the corresponding period of 1900, we find increases of 2,180 tons of frozen mutton, 16,336 tons of frozen beef, 5,554 tons of jerked beef, 94,889 tons of wool, 416,671 tons of maize, 130,679 tons of linseed, 183,033 lb. of butter, and 1,635 lb. of cheese. Coincident with these we get decreases of 16,653 head of cattle, 171,862 sheep, 904,855 tons of wheat, and 17,920 tons of hay. The marked decrease in the exportation of live animals dates back to the early half of 1900, when the British ports were closed on account of the appearance of foot-and-mouth disease in Argentina. However, whilst the exports of sheep have dwindled to one-twentieth of their dimensions two years ago, those of cattle have not declined even to one-third. There is a revival in the trade in jerked beef (*tasajo*), an article which is sent to neighbouring South American countries. The wool shipments from Argentina are irregular, the present export being more than twice the quantity in 1900. Exports of butter continue to expand slowly but continuously, but those of cheese are at present insignificant. As regards grain supply, Argentina is erratic; the quantity of wheat shipped last year was less than half as much as in the previous year, whilst nearly double the quantity of maize was exported. Most of the exports of hay—lucerne, or alfalfa—come to this country, and the quantity does not vary much from year to year.

LABOUR RETROSPECT.

UNITED KINGDOM.—During the past year a backward movement has been apparent in many important branches of industry. The retrogression has taken place slowly, but nevertheless steadily, and in the closing month of the year was noticeable in the shipbuilding industry, in iron and steel manufacturing, and in the engineering and metal trades generally, in all of which branches an unusual number of men were out of work. Employment in coal-mining was not so good, but wages in South Wales, although showing a fall of $7\frac{1}{2}$ per cent. on twelve months ago, are still more than 60 per cent. above the standard. In the engineering trades, relations between employers and employed remain on an amicable basis, as it has been arranged that the working agreement arrived at after the great strike should, with a few modifications, continue in force. Some of the Scottish steel companies have announced their intention of extending holidays to one month, in consequence of the slackness of trade. The cotton industry is in a better position than it was at the beginning of last year. Information for November respecting factories employing about 78,000 women and girls shows that 94 per cent. of those in spinning mills, and 71 per cent. of those in weaving factories were working in factories giving full employment throughout the month, to be compared with 84 and 71 per cent. respectively in October.

Sir Edward Fry's award in the Grimsby fishing dispute has been issued. It will be remembered that for the chief engineer the men demanded 38s. per week and poundage at 4d. in the pound of net profit. The owners offered 34s. and a poundage of 3d., food being assumed in all cases. Sir Edward

Fry awards 34s. with poundage at $3\frac{1}{2}$ d. For the second engineer the demand was 30s. with 3d. poundage, the offer was 27s. with 2d. poundage, and the award is 27s. with $2\frac{1}{2}$ d. poundage. For the third hand the demand was 23s. with 2d. poundage, the offer was 20s. with 2d. poundage, and the award is 20s. with poundage at $2\frac{1}{2}$ d. There is no doubt that the method of payment favoured by the arbitrator is best calculated to make the men do their work efficiently. One strong point which the share fishermen (skippers and mates) made was with regard to signing on, as they objected to this taking place at the Federation offices. Under the award, all men must sign on at the Board of Trade office for the protection of the masters, as they must sign off at the same office for protection against the masters. Sir Edward Fry goes very carefully into the numerous duties of the hands employed, and his ruling on the various points appears to have given general satisfaction.

COLONIES.—In AUSTRALIA, two measures of importance to labour have just become law. The Alien Immigration Restriction Bill, some of the clauses of which have provoked much discussion, has passed the Commonwealth Parliament. The other, which deals with industrial arbitration, has been passed by the NEW SOUTH WALES Legislature. The latter is considered to be the most resolute and consistent attempt yet made to deal with disputes between capital and labour, because it not only compels a reference of all such disputes to a competent court with power to enforce its orders and awards, but it makes a strike or a lock-out before such reference or during its pendency a misdemeanour punishable by fine or imprisonment. Every industrial dispute—a phrase which is defined in terms which include every possible matter which can arise between an employer and his workmen—can be referred to the Court either by the industrial union interested or by the registrar. Orders of the Court may be enforced, as in New Zealand, by injunction or by fines and penalties levied on the corporate funds of the union and on individual members, but they are also enforceable by a totally new method—namely, the declaration of a common rule. This gives the Court power to declare that any practice, usage, condition of employment, or industrial dealings, shall, with such limitations and exceptions as the Court may declare, become a common rule for all persons employed in the industry which is under review. This authority will be a most powerful instrument to compel obedience to the decree of the Court, and upon its efficacy will probably depend the success or failure of the whole measure. The Court has also power to declare a standard wage. The lasting effect of the drought in QUEENSLAND is shown in the latest report of the Labour Bureau. It attributes the increase in the volume of unemployed labour to the effects which the prolonged drought had upon the pastoral and kindred industries. While the drought lasted, however, many hundreds of men found employment travelling stock, or providing emergency feed, etc. Nearly all these men were thrown out of work by the break-up of the drought. In order to cope with this difficulty the Government decided to have certain authorised railway lines constructed by day labour instead of contract. In July, 1901, 1,100 men were being employed, either at day wages or piece-work, upon certain selected lines. The Queensland Government has issued a formal appeal against the Pacific Islands Labourers Bill, on the following grounds:—That the provisions of the bill are in direct conflict with the principle laid down by Mr. Chamberlain, that legislation imposing disqualifications on account of race and colour is contrary to the general conceptions guiding British rule throughout the Empire; that the Bill provides for the forcible expulsion of many persons whose original coming to Queensland was lawful, and who have for many years enjoyed the protection of British laws; and that the provisions of the Bill will inflict a grievous wrong on the State of Queensland as distinguished from the rest of the Commonwealth.

Mr. Cecil Rhodes has made public some valuable opinions concerning land settlement in SOUTH AFRICA—a question upon which he is well qualified to speak. He favours the adoption of some scheme by which a portion of the Yeomanry could be retained in the country, and suggests that offers should be made to the present troops of a yearly capitation grant of, say, £25 per man, and, perhaps, a horse allowance of £12 per year, to those who would remain in the country and serve when called upon for its defence. They should receive land in one of the irrigation colonies, the extent of an allotment to be in accordance with its productive capacity, such allotment to be sufficient to maintain a family in comfort, with communal grazing over the balance of the land owned by the settlement. Mr. Rhodes, in discussing the details, points out that the scheme is not a vast one, as, taking the maximum at 4,000 men, the 2,000 allotted to the Transvaal would require only sufficient irrigated land as would support each family in comfort, the balance being merely communal grazing. In the Free State practically the whole strip along the Basutoland boundary, termed the "Conquered Territory," is capable of being put under the plough. In the meantime, it is cheering to hear that more mines on the Rand are getting to work, the Commander-in-Chief having sanctioned the dropping of 100 stamps weekly up to 15th January. It is hoped that by the end of February one-fourth of the mines will be re-started. A revision of the regulations governing native labour has been under consideration for some months, and the new enactments have now been drawn up. Between a desire to support the gold industry and, at the same time, to protect the native labourer, these regulations appear to strike a happy mean. It is provided that all labour agents and compound overseers shall first obtain a licence, so that when the native enters into a contract of service, he will be safeguarded against coercion and fraud. A feature of the new regulations is

the absolute prohibition of the supply of liquor to natives, under the severest penalties. Inspectors of mines will be provided, whose duties will be to guard the interests of the natives, and to investigate matters relating to contracts and wages, from which regulation no one will be allowed exemption. The duration of contracts will not exceed one year, except with the approval of the Native Commissioner himself.

The Emigrants' Information Office has collated a number of practical notes and much good advice with regard to our WEST AFRICAN Colonies, and, after revision by the Governments concerned, has issued this information in pamphlet form. The territories dealt with are Gold Coast, Sierra Leone, Lagos, Gambia and Southern Nigeria, and the dominant note throughout is that the whole region is quite unsuited for colonisation by European settlers, as the climate renders continuous residence on the coast almost impossible. There is employment for a certain number of lawyers and doctors, but the openings for white labour generally are few. The mines require miners, and the mercantile firms need assistants, but all these men are sent out by appointment from England. Professional men should first make careful enquiries as to prospects from experienced residents before going out. West Africa is only suitable for persons of sound constitution and temperate habits, and every one should be medically examined before deciding to go there. It is not desirable that anyone under 22 years of age should go out to the West Coast.

INDIA.—A retrospective glance at the industries of India last year reveals a somewhat better condition of affairs than that which prevailed in 1900. There has been a recurrence of famine, but distress from this cause has not been so widespread, the Bombay Presidency being the chief sufferer. As against the depression in agricultural pursuits, it is satisfactory to note that India's mineral wealth is becoming more and more developed, and that a considerable progress in her manufacturing industries has taken place. Much has been done by the Government in the interests of labour. In the Assam Labour Bill, a praiseworthy attempt has been made to improve the condition of the coolies without placing too great a burden on the tea industry. The labour clauses of the Indian Mines Act have been revised in a satisfactory manner. By the investigations of the Famine Commission and of the Plague Commission, the authorities should be better able to safeguard and relieve the natives in the time of future visitations, and it is to be confidently hoped that the new year will be one of further improvement and progress.

FOREIGN COUNTRIES.—It has been stated in more than one of the American trade journals that the great steel trust has determined on a new policy with regard to the labour they employ. They contemplate substituting American men and boys for the foreigners, and particularly the Welsh tin-workers, who now take such a large share in operating the big mills of the country. It is doubtful if immediate action will be taken in this direction, but the matter is under serious consideration. It has been found, particularly in time of strikes, that the illiterate foreigner is a hard proposition to handle, and it is believed that the American labourer and the skilled mechanic can be dealt with more easily. Although it may mean a great increase in the rate of wages now paid, the companies can afford to pay more if they are insured against constantly recurring troubles with the men. As the result of a convention, recently held in New York, a committee has been appointed, consisting of twelve representatives of organised labour, twelve representatives of labour-employing concerns, and twelve independent gentlemen, in order to consider the question of harmonising capital and labour and averting strikes. This committee has much in common with the Courts of Arbitration and Conciliation in the North of England, and declares in its programme that it will undertake such work as may seem necessary to promote industrial peace, to be helpful in establishing rightful relations between employers and workers, to endeavour to obviate and prevent strikes and lock-outs, and to aid in renewing relations wherever a rupture has occurred. The committee assumes no power of arbitration unless conferred by the parties to the dispute.

The British Consul at Stuttgart, referring to the present depression in GERMAN trade and industries, says that the chief failures in Germany during the last 18 months have been those of banks, and not of factories and works founded on a sound basis. In spite of the general depression there are several favourable symptoms. Thus, the revenues of the State railways show an increase; the position of Germany in the markets of the world does not seem to have suffered materially; but the number of the unemployed is increasing, and relief works have had to be started in some places. The difficulty of finding employment has induced many workmen, whose term of military service has not yet come, to proffer themselves voluntarily to the military authorities without waiting for the official call. They think that by entering now they can tide over the bad times, and may find a more flourishing state of affairs when their term of service is over. Trusts appear to be increasing in Germany, and now include many leading industries, although in textiles they have not been successful. Raw and accessory materials and unfinished products, such as coals, pig iron, copper, rails, chemicals, sugar, and petroleum, seem to have lent themselves best to the formation of trusts. Public opinion in Germany is divided as to their utility. They are supported, even by eminent economists, as beneficent, and are denounced as subversive of all normal commercial development. In some few cases they are approved by the working classes concerned, but, as a rule, they are feared and disliked by the workmen, on account of their great power and extensive ramifications.

SCIENTIFIC AND TECHNICAL DEPARTMENT OF THE IMPERIAL INSTITUTE.

THE SUGAR INDUSTRY OF QUEENSLAND AND NEW SOUTH WALES.

The Director of Sugar Experiment Stations in Queensland, Dr. W. Maxwell, has made an important report on the sugar industry in Queensland and New South Wales, which is published as a supplement to the *Queenslander* of August 31, 1901. Some account of cane cultivation in Queensland was given in the article on "Sugar-Cane Cultivation in Behar" in this JOURNAL (June, 1901, p. 155); in the present report the industry is considered in its bearings on the question of Asiatic and Polynesian immigration, which is now attracting so much attention in Australia, and the following is a *resumé* of its contents.

The climatic data of different districts is given in the following table, from which an understanding of the general variations may be arrived at, but which does not cover the whole climatic situation of each district:—

STATES.	DISTRICTS.	Mean Minimum Temperature in 4 Years.	Mean Maximum Temperature in 4 Years.	Mean of Temperature in 4 Years.	Highest Temperature in 4 years.	Lowest Temperature in 4 years.	Total Units of Heat per Year.
Queensland.	Cairns . . .	67·6	83·3	75·4	100·4	45·1	27,516
	Mackay . . .	63·9	79·8	71·9	96·6	frost	26,280
	Bundaberg . .	61·3	83·4	72·3	99·6	frost	26,389
New South Wales.	Tweed . . .	55·4	78·2	66·2	—	frost	24,163
	Richmond . .						
	Clarence . .						

QUEENSLAND.

The "plantation" system in which the growing of the cane and the manufacturing of the sugar are one concern, and which can only be carried on by capitalists owning large estates, has been superseded by the system of central factories which buy the canes from the farmers and manufacture the sugar. The inauguration of the Government central mill system has made the growth of canes on small farms possible, and has brought about a great change, of which the most highly important economic and social result is that a large number of strong, responsible and progressive white settlers are being established over the sugar-growing areas. At this time there are 2,610 cane-growers in the State of Queensland, with an average area of 42·6 acres per grower under sugar-cane. These small farmers, with their families, are engaged in cultivating their own lands for their own direct gain, with a personal interest in the occupancy of the lands, and have modified the exclusive employment of subject-labour. The number of Pacific Islanders employed has decreased from 10,755 in 1885 to 8,826 in 1899, yet the sugar made has risen from 55,796 tons in 1885 to 123,289 tons in 1899.

It is of paramount importance to realise that the present production of the lands centring round the sugar mills cannot be maintained unless the present sum of labour-power, in some form, is kept up. To reduce the present equivalent of labour-power would be to reduce the current weight of cane produced, and if that falls below a given minimum the mills must stop, as they cannot then meet the bare expenses of running. At the present time the labour furnished by the cane-growers themselves is utterly inadequate to produce the bulk of cane requisite to keep the mills in operation, and hired labour is necessary. The hired labour includes Europeans (chiefly Anglo-Saxons), and Asiatics, Hindoos and Pacific Islanders.

By the Pacific Island Labourers Act the white labourer is protected, and the positions "of engineers, engine-drivers, engine-fitters, blacksmiths, wheelwrights, farriers, sugar-boilers, carpenters, sawyers, splitters, fencers, bullock-drivers, mechanics, grooms or coachmen, waggoners, or household servants," are reserved for his selection; whilst the field work is left for the Pacific Islander, but the white labourer can undertake this, too, if he wishes.

The compensation, that is wages and rations together, received by the white labourer per week for field work varies from £1. 7s. to £1. 17s. The mill hands receive from £1. 7s. 9d. for labourers to £4. 16s. 8d. per week for sugar boilers. The importation and employment of Pacific Islanders are regulated by very stringent and detailed enactments, prescribing among other things their food rations, clothing and medical attendance. The cost of a Pacific Islander in the Bundaberg district is £37. 2s. 3½d. per year, and in the Mackay district it is £32. 0s. 10d. An Islander who re-engages after the end of his first term of three years costs somewhat more, namely, £38. 6s. 4d. per year.

The comparative cost of white and Pacific Island labour in the cane fields is as follows:—

Class of Labour.	Cost per Year. £ s. d.	Cost per Week. £ s. d.	Cost per Working Day. £ s. d.
White labour . . .	80 7 10	1 10 11	0 5 2
Pacific Island labour . .	36 14 10	0 14 1½	0 2 4½

For comparison it may be stated that in Louisiana (U.S.A.) day wages paid to white men in the field averaged about one dollar (4s. 2d.), while the daily wage of the negro was seventy-five cents (3s. 1½d.). In the Hawaiian Islands the unskilled white labourers received about one dollar (4s. 2d.) per day, and the Asiatics seventy cents (2s. 11d.).

Not only must the cost of the different kinds of labour be compared, but also differences in (a) skill or competence to perform work; (b) personal endurance of work; (c) stability in attendance at work; (d) rate of wage for performance of work. The difference of skill is of less importance, as the Pacific Islander is excluded by law from competing in the skilled operations. The endurance of work differs in different districts; the following table gives statistics for limited localities in two districts:—

District.	Working Days in Year.	White Labour.		Pacific Islanders.	
		Days of Work.	Days Lost.	Days of Work.	Days Lost.
Bundaberg . .	313	295	18	295	18
Mackay . .	313	292½	20½	299	14

But a sounder idea can be obtained from notes and statements which cannot be expressed in tabular form. In the Bundaberg district it was found that permanent white hands, say 75 per cent. of the total employed, work approximately fifty weeks yearly. Hands for crushing season do that season only, which ranges from twelve weeks to thirty weeks, or an average of twenty-two weeks. On account of the large amount of sickness during the first year of his term, the Islander is off more days by sickness than the permanent white man. The records of the Mulgrave Central Mill Company show that in 1899 the cutting season commenced with 58 Islanders, 60 Chinese, and 95 Hindoos in the field. During the first months of the cutting season there was little sickness, but as the work extended into the hot weather the original cutting force of 213 men was reduced to 183, whose labour efficiency was much reduced. In place of the sick and disabled men, an extra force of 12 Islanders

and 33 Chinese were put on to keep up the supply of cane, thus requiring 228 men to perform the work towards the end of the cutting season which was done by 213 men during the cooler months at the beginning. The records do not show any white men to have been engaged in the cane cutting.

In considering stability in the performance of work, the white labour has to be divided into two classes, namely, the permanent hands who are employed the year round as team men in the fields and as skilled workmen in the mills; the men of this class are usually picked men of good habits and of good health; it is found that in the main they remain in their positions, and are generally stable in the performance of work where the conditions of nature allow of continuous labour. The second class of white hands is required only during given seasons of the year; in the field during the cutting of the cane where this may be partly done by white men, and in the mills during the crushing season, consequently instability amongst them becomes a part of their conditions, and there is a notable measure of unreliability amongst them. It is found, however, that the instability is greatest in the Northern district, where the personal endurance of work is the lowest; and much of the instability is to be put down to sheer inability to do given kinds of continuous work in those natural conditions.

The conditions of nature in the north render continuous labour by the white man, even in the kinds of work reserved to him by the law, a great physical strain and difficulty, while for the classes of work such as trashing and cutting cane, which are done by the lower types of labour, the white man is practically unfit. This is emphatically supported by the statements of a high medical authority, in the course of an enquiry concerning the action of the climatic conditions in the Northern sugar district of Queensland.

The report next deals with the employment of mechanical and chemical aids in the industry. The ploughing and preparation of the land for planting, and the cultivation and cleaning during growth by means of implements worked by horse power, are reserved for white labour by the provisions of the Acts; these provisions are violated, it is true, but to a decidedly limited extent. There are certain operations equally necessary to the production of the cane crop, which the white labourer has shown a disgust for and frequently declared his inability to perform, namely, hand-weeding, trashing and cutting of the cane, and these are done by the Pacific Islanders. The trashing of the cane, which consists in removing from the stem every dry and fading leaf which has ceased to perform its functions, although imperatively necessary in many districts, and mostly so in those conditions of climate where the white labourer is the least able to perform it, is being neglected, yet at a great cost in the quality of the cane juice.

Great efforts are being made to invent a machine for cutting the cane and thus bring it into the sphere of the skilled labourer. Six different devices have been submitted to the Queensland Government, but it is not possible at this date to indicate how soon a satisfactory device for the purpose will be available.

Lands on which sugar cane is grown suffer great deterioration in their chemical condition; thus the crops of the small cane-growers at the Herbert River decreased from 40 tons per acre to 16, 13, and 12 tons, and the returns of some individual farmers in North Mackay showed a production reduced to merely 4 or 5 tons of cane per acre, whilst in other districts as low as 7 and 8 tons of cane per acre are recorded. The average yield of cane to-day throughout Queensland is about 15 tons per acre, against about 40 tons per acre during the earlier years of the industry. The exhaustion of the soils is shown in the following table:—

	Contained in Virgin Soils, per Acre. lb.	Contained in the Cropped Soils, per Acre. lb.	Loss of Elements per Acre. Per cent.
Lime	3,747	2,538	37·2
Potash	747	432	42·2
Nitrogen	4,650	3,240	31·0

These data set forth the causes of the weakened producing power of the soils; their immediate yielding power has been seriously impaired, but by modern methods of cultivation, rendering available the reserve stores of plant food, and by returning to the lands those elements which are being removed, the producing power can be restored. Time, however, will be absolutely essential, and also the secured freedom of the farmer from any embarrassments which could result from interference with the agencies by which he is carrying on his work.

The volume of the Queensland sugar crop can be gathered from the following table. The lowness of the 1900 crop was due to extreme drought.

Year.	Acres Crushed.	Weight of Sugar. Tons.	Yield per Acre. Tons.
1897	65,432	97,916	1·49
1898	82,391	163,734	1·98
1899	79,435	123,289	1·55
1900	72,651	92,554	1·27

The mean production of the four years was 119,373 tons of sugar, with a yield per acre of 1·59 tons.

The prices of raw sugars of 88 per cent. net titre, f.o.b. at Queensland ports, for the season commencing 1st July, was £8 per ton, with a bonus which is estimated to have added £1. 19s. per ton, thus making a total of £9. 19s. per ton. The price of best white sugar in bond at Brisbane from January to June, 1901, was £16 per ton, this with the duty of £5 makes £21 per ton.

NEW SOUTH WALES.

The areas embraced by the cane-sugar industry of Australia commence in the north upon the 16th degree of latitude and extend south, covering the districts of Mackay, Bundaberg, and the border sub-district of the Logan, and finally descend into New South Wales, where the sugar-cane made for itself a home and a history on the banks and elevations of the Tweed, the Richmond and the Clarence rivers. The records show that in 1864 2 acres of sugar-cane were grown in New South Wales; in 1898 14,578 acres of cane were grown and 29,110 tons of sugar were made. In 1899 the acreage was 9,435; the cane weighed 170,509 tons, a yield of 18 tons per acre, and 15,352 tons of sugar were made. For the same year the production of Queensland was 1,176,466 tons of cane, or 14·8 tons per acre.

The cane interest of New South Wales is of the very highest economic importance to the districts of its location, and should the industry suffer a relapse or go down, such a calamity would carry further interests and the general prosperity of the districts down with it. The mean acreage per grower in New South Wales does not exceed twenty acres, which is less than one-half that of the Queensland growers, which is 42·6. Mixed farming is much more extensively practised in connection with cane-growing than in Queensland; maize being grown upon a considerable scale, and dairying being conspicuously developed, yet cane-growing is looked to as the main industry and the keystone of the continued prosperity of the sugar districts. If the sugar industry disappeared, the home market for dairy products would largely disappear too, since the large number of white hands engaged in sugar work are the chief consumers, and the best customers of the mixed farmers.

In New South Wales the amount of hired labour in the fields is relatively less than in Queensland; this is due to the areas cultivated by individual farmers being less than one-half the size of what they are in Queensland. The hired labour in the fields is chiefly white, but it is supplemented by Pacific Islanders, Hindoos, and some Asiatics. The trashing

of cane, however, is done wholly by the Hindoos or Islanders. The cutting and harvesting of the cane is done chiefly by the mills; if the farmers cut the cane themselves the mill allows 3s. per ton for the work. The cutting is done sometimes by white and sometimes by coloured labour. The conditions are more suitable for the "endurance" and "stability" of white labour than in Queensland. The number of aliens employed in the sugar districts is 933, comprising Islanders and Hindoos. The mean compensation to white labour for work in the cane fields is £1. 8s. per week. Cane cutting is done by contract and on terms whereby the men can earn 7s. per day; they work from daylight till dark. Thus the climatic conditions enable the white man to perform work and earn a rate of compensation which are utterly out of question in the sugar districts of the North.

The wages paid to alien labour are very variable, ranging from a little more than one-half the white man's daily rate, up to an equal rate during the scarcity of labour at the crushing season; the factor of alien labour is not so prominent as in Queensland, as white labour is more easily obtainable from the centres of population in the south and its efficiency is greater.

If the conditions and costs of labour in the sugar districts of New South Wales are considered, then the laws and results observed in Queensland are found in a more accentuated form. The labour co-efficient of the white labourer is more pronounced, while the alien sinks in prominence and concern. From this it appears that the labour powers in the climatic extremes of the sugar areas are made to economically compensate each other; the higher efficiency of the Pacific Islander, at a relatively less cost, who predominates numerically in the Northern districts, counter-balancing the dominating efficiency of the white labourer, who prevails in greater numerical strength in the districts of the South, and whose labour stands at a relatively low cost in those districts when compared with the North.

SUGAR-CANE EXPERIMENTS IN THE WEST INDIES.

A large amount of experimental work is being carried out under the direction of the Imperial Department of Agriculture for the West Indies, with the object of improving the sugar-cane to such an extent that its cultivation will again prove remunerative to the planters. The lines upon which the work is proceeding have already been described in this JOURNAL (Vol. vi., p. 126, and Vol. vii., p. 210), and here it will suffice to say that at present attention is being chiefly devoted (1) to ascertain the varieties of cane most suitable for the particular local conditions, the main points aimed at being a heavy tonnage of cane per acre and a high yield of sugar, and (2) to determine the manurial requirements of the sugar-cane. The report on the experiments conducted in the Leeward Islands (Antigua and St. Kitts) during the season 1900-1901 has just been issued in two parts, which, together, make up 110 foolscap pages, and well illustrate the amount of work which the enquiry entails.

Dealing first with the experiments on the selection of canes (Part I. of the report), it may be noted that although sugar is the staple industry in both islands, yet until recently the only variety of cane grown in Antigua was the Bourbon, while in St. Kitts only two—the Bourbon and the Caledonian Queen—were cultivated. A large number of other varieties, many of which had already been tried elsewhere, were therefore available for experiment, and the most promising of these are now under observation. In Antigua nine experimental stations, the ground of which varies from very heavy clay to light calcareous soil, have been established, and at the principal one 34 varieties of cane were under cultivation, while to each of the other stations the 14 best varieties were distributed. The results obtained may be illustrated by the following table, giving the yield of cane sugar from the six best plant canes:—

No.	Name of Cane.	Cane. Tons per Acre.	Juice. Gallons per Acre.	Juice. Gallons per Ton of Cane.	Cane Sugar. Pounds per Gallon of Juice.	Cane Sugar. Pounds per Acre.
1.	D. 95	28·2	3,931	139·4	2·075	8,158
2.	Mont Blanc	27·1	3,588	132·4	2·022	7,256
3.	Naga B.	26·2	3,574	137·0	1·996	7,134
4.	Burke	27·6	3,646	132·1	1·952	7,117
5.	D. 102	27·3	3,681	134·8	1·897	6,984
6.	Red Ribbon	25·4	3,402	134·9	2·035	6,923

Of the above, the first two, D. 95 and Mont Blanc, occupied the same positions last year; Naga B. was fourth, Burke was ninth, and D. 102 was eleventh. Several of the canes show a loss of position when compared with last year's results, the most noteworthy being the Caledonian Queen, which was formerly third and is now ninth, while D. 116 has fallen from the fifth to the thirteenth place and B. 147 from sixth to twelfth. This, however, may be due to the difficulty experienced in getting these canes to start growing, owing to the drought which occurred after they were planted, and they were consequently somewhat handicapped throughout the season. On the other hand, one or two of the very easily established canes, such as the Burke and B. 109, obtained a much better position this year than last, probably for the same reason. The weights of cane per acre, as well as the amount of sugar in the juice, were in excess of those recorded last year, and D. 95 has again yielded the richest juice and the heaviest tonnage of cane, being second only to B. 147 in the amount of juice expressed by the mill. The trials have shown that the Bourbon cane, which was formerly exclusively grown, is much more liable to attacks by rind fungus than many other varieties, and is consequently not so suitable for cultivation. On only three plots were the canes reaped as ratoons, and it is interesting to note that five of the six canes which give the best results were included in the six best plant canes of the previous year, from which the ratoons were derived, though the order is slightly different. This would seem to show that good plant canes also possess good ratooning powers. In this series D. 95 has been surpassed by White Transparent and Naga B. in the proportion of sugar in the juice, while B. 147 and D. 95 are again noteworthy as yielding a high percentage of juice on crushing.

In St. Kitts, 20 selected cane varieties were grown at seven stations, and, as the soils here are much more sandy than those of Antigua, different results were to be expected. The figures for the six best plant canes may be quoted for comparison with those already given:—

No.	Name of Cane.	Cane. Tons per Acre.	Juice. Gallons per Acre.	Juice. Gallons per Ton of Cane.	Cane Sugar. Pounds per Gallon of Juice.	Cane Sugar. Pounds per Acre.
1.	B. 208	38·8	5,035	129·8	1·947	9,817
2.	Naga B.	39·1	5,067	129·6	1·767	8,956
3.	B. 147	37·8	5,057	133·8	1·755	8,874
4.	B. 376	39·1	5,052	129·2	1·688	8,526
5.	D. 116	38·6	5,153	133·5	1·609	8,290
6.	D. 74	35·3	4,606	130·5	1·735	7,992

The percentages of juice obtained from the canes and of sugar in the juice were both lower than in Antigua, but the tonnage of cane per acre was much greater, and, owing to this, the yield of sugar per acre was also greater. B 208 has so far given better results than any other cane, while Naga B. and B. 147, both well-known varieties, come second and third

respectively. The other three canes in the above list are not so well-known, but from the results quoted they appear to be worthy of further attention. D. 95, which has yielded such good results in Antigua, is here only twelfth, showing that it is not so suitable for the soil in St. Kitts. Very few rotten canes were met with at any of the stations, and the new varieties appear to be less liable to fungoid attacks than those previously cultivated, besides yielding in some cases much better results.

The experiments on the "chemical selection" of canes have also been continued. In this method canes yielding a juice which analysis shows to be richest in sugar are selected for propagating from, in the hope that the plants obtained from them will maintain or increase the yield of sugar. For the purpose of experiment, the ten richest and the ten poorest canes of the white transparent variety were chosen, as it was thought that the results of the selection would be most strikingly shown by a comparison of the two series, one tending toward a richer and the other toward a poorer juice. The experiments of course will have to be carried out for several years before any definite conclusions can be drawn, but it may be recorded that the first year's results show a gain of 1 per cent. in favour of the "high" canes, which, however, is so small as to be within the limits of experimental error.

The manurial experiments are fully described in Part II. of the report, which includes 43 tabular statements of results, and here it will only be possible to summarise the chief features. The manures experimented with were as follows:—(1) nitrogen, as sulphate of ammonium, nitrate of sodium and dried blood; (2) phosphate, both as basic and superphosphate; (3) potash, as sulphate, and (4) guano. In the experiments on plant canes it has been found necessary to distinguish those stations where pen manure was employed from those where it was not, since the results obtained in the two cases differ considerably. Where pen manure had been employed the application of nitrogen produced no material gains, potash gave small gains, phosphate caused losses, and guano no considerable gains. Where no pen manure had been applied, and the fields were in good condition, both nitrogen and guano proved remunerative, phosphates produced losses or no gains, and potash increased the yield; on the other hand, a field in poor mechanical condition was not benefited in the above way, and the state of the soil therefore appears to be of great importance, since where this was defective the application of artificial manures was of no avail. It is concluded that it is possible to grow good crops of plant canes with the use of pen manure only (including also organic manures such as green dressings), and where this can be obtained in sufficient quantity artificial manures are unnecessary. If, however, pen manure is not available, good crops may be obtained with the aid of artificial manures containing nitrogen and potash. The course to be adopted with phosphate is not yet clear, but, if any is used, an application of basic phosphate in the proportion of 1 cwt. per acre is recommended. Under the conditions existing in the Leeward Islands it is suggested that it would be preferable to devote money to the production of pen manure rather than to buying artificial manures, though the latter might find a place in the raising of green dressings for manurial purposes.

THE IDENTIFICATION OF WOOD.

Considering the enormous extent to which the timber trade of the world has grown during recent years it seems strange that, up to the present, no scientific method has been introduced for identifying the many kinds of wood which come upon the market. Some attention has, however, been devoted to the question, and in a lecture before the Society of Arts (*Journ. Soc. Arts*, Vol. L. p. 40), Mr. Herbert Stone, one of the Imperial Institute expert referees on timber, gave an outline of a method which he proposes to use for distinguishing commercial woods by their anatomical characters. The unsatisfactory nature of the present means of identification will be apparent when it is stated that it is quite common for a strange piece of wood to be handed round until someone is found who can recognise it; that cases have occurred where a wood, well known and largely imported, has been pronounced by various timber merchants to be something entirely different; that inferior woods are often substituted for others which they superficially resemble, and that in one case an inferior wood, selling at a low price, was much increased in value by the very simple expedient of changing its name. In addition, very many consignments of excellent timber reach this country, but, owing to lack of information regarding the name, origin and properties of the wood, it is extremely difficult to dispose of, and finally has often to be included in a rummage sale of "unrated" timber in order to recover the freight and dock dues, the result being of course considerable loss to the sender. Afterwards it has frequently occurred that some of these unnamed woods have proved to be very valuable on account of beauty or other property, and have been much sought after, but it is almost impossible to procure further supplies, as, owing to the fate of the first consignment, no more comes upon the market, and, the name and source of the timber being unknown, the sender cannot be communicated with. In a few cases such unknown woods have been identified by means of their anatomical characters, and the source has in this way been discovered, but this method cannot be generally applied at present owing to the limited data at disposal.

The value of the study of the anatomical structure of the wood, as a means of identifying and classifying plants, has been demonstrated by Radlkofer, Solereder and other botanists, but their work has been confined to the examination of small twigs and stems such as usually occur in herbarium specimens. Moreover their attention has been chiefly devoted to the primary wood, and as timber consists of secondary wood, often differing considerably from the former in structure, their results are of little value for commercial purposes. In Germany, however, considerable work on the structure of timber has been done; the European timber-trees have been described in a fairly complete manner by the two Hartigs and Schwartz; Mayr has studied the characters of the conifers of North America, while Nördlinger has described the structure of 1,100 different trees. None of these workers, however, has devised anything approaching a scheme of classification, and the artificial keys which they have drawn up for purposes of identification are either limited in their application or quite unsuitable for practical purposes. The most important English work dealing with the structure of wood is Mr. J. S. Gamble's "Indian Timbers," of which a new edition describing 1,500 different varieties is about to be issued, but, as the descriptions in this are confined exclusively to the native species, they cannot be applied to timbers of other countries.

The points which must be relied upon in a scheme of classification based upon anatomical structure may be briefly noticed before indicating the lines upon which Mr. Stone proposes to proceed. In nearly all transverse sections of wood the annual rings are the most conspicuous feature, but the width of these is rarely of value, since, owing to various causes, it may vary widely even in the same tree. In the oak, for example, the rings will vary from one-sixteenth to five-eighths of an inch in width. The broadest ring will, however, always show the structure of the wood to the best advantage and should, therefore, be selected for examination. The next point to observe, by means of a lens if necessary, is the presence or absence of the true pores—the wood vessels—which, when present, are always most numerous in the spring wood, *i.e.*, the innermost side of the ring. The size of the pores also shows considerable variation, both in the different rings as well as within the limits of each individual ring. In the former case it appears to depend chiefly upon age, and in many woods, such as the oak, the average size increases from year to year until the tree reaches its prime, when it becomes more or less constant. Taking each individual ring, the pores are largest on the inner side, and on passing outwards they always diminish, sometimes only a little, as in the maple, but more frequently to vanishing point, as in the oak. Accurate measurements of the size of the pores are therefore not of much value as a guide, and the

method generally adopted is to take a series of well-known woods as standards of comparison. It should be mentioned that in many tropical woods, whose growth is almost uninterrupted, the ring-boundaries become indistinct or even entirely lost, and the size of the pores appears to increase regularly from the pith outwards. If pores are found in the middle or outer part of the ring while the inner portion is free from them, it is quite certain that they are resin ducts and that the wood is a coniferous one, probably a pine or spruce. The rays, running radially through the wood, are universally present, and, as they vary considerably in different species—in width, height, lustre, straightness, etc.—and can be easily observed, they are of great value for purposes of identification. The extent and distribution of the wood-parenchyma or soft tissue are also important characters, capable of showing wide differences, since this tissue may vary from small patches surrounding the wood-vessels to prominent circles concentric with the rings. In addition to the transverse, the longitudinal sections, both radial and tangential, should also be examined, and will often clear up obscurities in the structure as shown by the former, besides enabling a complete general idea of the wood to be obtained.

The key which Mr. Stone proposes to use for identification depends for its first division upon the character of the rays, which appear to be the most constant feature in timber. Woods having two kinds of rays, as many *Cupulifera*, are separated from those which have but one; the latter are then divided into two classes according as the rays are separated by distances greater or less than the transverse diameter of the largest pores; further subdivisions depend upon the presence of soft tissue and its distribution, followed by the arrangement of the pores and concluding with the definiteness of the ring-boundaries. In this scheme the most easily recognised characters are used for the first divisions, so that the more indefinite ones are left to the end, where there will be fewer species to deal with and other aids can be employed. After the woods have been divided into these ultimate groups the physical and chemical characteristics may be utilized where necessary for further discrimination. In these respects the following points can be usefully observed and recorded:—(1) the range of weight per cubic foot; (2) the hardness (for the practical determination of which Mr. Stone has devised a very simple instrument); (3) the colour of the solution produced by boiling a small quantity of the shavings in water and alcohol; (4) the reaction with iron salts; (5) the capacity for absorption of water; (6) the phenomena observed on burning, such as the exudation of a coloured resin or the production of a characteristic odour or ash (the two Australian paving woods, jarrah and karri, may be distinguished by their yielding on burning a black cinder and a white ash respectively); (7) the character of the surface, whether dull or lustrous, and the particular elements, rays, pores or soft tissue, which produce the effect, and (8) the colour.

For any such scheme to be of value it is essential that authentic specimens of the different woods should be carefully examined, so that their structure may be definitely placed on record for future reference. The botanical name of the plant must also be attached to the description, since the vernacular names often give rise to considerable confusion, the same tree being sometimes known under different names or the same name applied to different trees. Mr. Stone intends in the first place to examine all the Colonial timbers, of which he has already obtained, through the Colonial Office, promise of authentic specimens from most of the colonies. After examination, it is proposed to convert these into several duplicate sets, which will be presented to various public institutions for purposes of reference. Such work will enable home traders to recognise unfamiliar Colonial timbers, which they may meet with, or to obtain supplies of any particular wood, and will also be of great benefit to the colonists as well.

BANANA CULTIVATION IN ASSAM.

The plantain tree, which yields the fruit known indiscriminately by the names plantain and banana, is commonly cultivated throughout Assam, the homestead of the native farmer being generally surrounded by clumps of plantain sufficient to supply the wants of the household, but only rarely affording a surplus for disposal in the local market, although the fruit commands there a ready sale at good prices. In order to encourage cultivation on a larger scale, the Agricultural Department of Assam has recently issued a *Bulletin (Vegetable Product Series, No. 3)*, giving an account of the best varieties of plantain, and of the methods of cultivation which generally give successful results with the tree. It appears that the varieties grown in the province can be divided into ten classes, of which the following short descriptions may be given here.

The Athia Group.—The members of this group are the hardiest of all the plantain species, and are those usually grown round the native homesteads. The trunks possess a dark green colour, without any reddish tinge, and the plant is easily reproduced from seed.

Monohar Group.—These varieties are less popular with the natives than those of the foregoing class. The trees are smaller than the *Athias*, and the sheathes of the fruit are lighter in colour.

Málbhog Group.—This class includes the best varieties of banana grown in Assam. The trees are comparatively short, and the whole external surface exhibits a reddish colour. The fruit has a perfectly smooth skin, and is of a deep yellow colour, the pulp being white.

Purí-Kal.—The fruit of this and the following varieties is usually employed in the unripe condition as a vegetable. The trees grow tall and straight, and so present quite a different appearance from the ordinary plantains, which bend towards the ground.

Hondá.—These trees closely resemble the more valuable *Málbhog* group, but the fruit has a green colour, even when quite ripe, and the pulp has a curious earthy flavour.

The other varieties known in the province are *Jáhaji*, *Cheni Chánpá*, *Barátmoni*, and *Gorinda Tulsi*, all of which have been imported from other countries, but do not appear to compare favourably with the native produce.

In cultivating plantain, a widely different procedure is adopted with the *Athia* varieties from that necessary in the case of the other groups, owing to the immunity which the former enjoy from the attacks of worms, a feature which enables the native to grow them, as already mentioned, close to his farm, on land sodden with nitrogenous refuse.

The finer kinds must be grown at a distance from the homestead, and preferably on land which has not previously borne any crops, and which is therefore comparatively free from worms; for the same reason it is necessary to change the plantation periodically, usually at the end of three years.

In planting, the young saplings are placed in holes of the proper size, and the roots covered over with earth, the positions selected being usually the vacant spaces in betel-nut plantations, since the plantain when mature affords the shade required by the betel-nut palm.

Great care has to be exercised in manuring the finer kinds of plantain to avoid manures which encourage earthworms, and so ashes, paddy husks, and vegetable refuse are generally employed rather than animal matter. The soil in the immediate neighbourhood of the roots rapidly becomes exhausted, and must be replaced by fresh mould. In order that the trees may get the full benefit of the soil, the ground should be kept clear of weeds, and the roots which tend to grow up out of the ground covered again with earth. The trees usually bear fruit two years after planting, but the different classes show some variation in this respect, and also in the value of the fruit they bear, the *Málbhog* class realising the highest price, and the *Athia* varieties the least.

Almost every part of the plantain is utilised by the natives; the fruits in the unripe condition are used as vegetables, and when ripe are eaten raw or cooked with rice and milk. Occasionally the pulp is preserved by being cut into thin slices and dried in the sun, while

a rough kind of flour is made from green fruits by drying in the sun and pounding into meal, which can then be kept in good condition for months.

The flowers are also in considerable demand as a vegetable, and occasionally the bark of the young saplings is eaten in this way.

The whole plant is used as fodder for elephants in times of scarcity.

The refuse portions of the tree, such as the sheathes of the leaves and the skins of the fruits, are burnt, and the ashes used for the preparation of alkali, which is employed in various native dyeing processes and native medicine.

THE CULTIVATION OF EMMER.

Emmer, or, as it is occasionally but erroneously called, "speltz," is a food-grain extensively grown on the arid lands of Central Russia, and also, to a smaller extent, in Servia, Germany, Spain, and Abyssinia. It has recently been introduced into the United States by Russian and German immigrants, and has, in a few years, become so popular that the attention of the Agricultural Department has been directed to it, and, in consequence, a *Bulletin* (No. 139) has been issued for the instruction of farmers who may wish to grow it.

The grain is the fruit of a species of wheat, *Triticum dicoccum*, probably derived from the simpler species, *Triticum monococcum*, from which it differs in having two grains—in place of one—on each spikelet. It first appeared in Switzerland, and from there spread to the countries already mentioned, but it is at present principally produced in Russia, the output there being usually about 16,000,000 bushels per annum. It appears to be grown also in Northern India, Thibet and China. The special advantage of emmer is that it grows well in almost any condition of soil or climate, all the varieties being drought-resistant, whilst rain at harvest time scarcely damages it. The plant thrives best, however, in prairie regions, where there is little rain and the summers are short and dry. Thus, in the Volga region of Russia, where emmer is most extensively grown, the annual rainfall is small, and occurs almost entirely during five months of the year, whilst the extremes of temperature experienced are considerable. Climatic conditions similar to these exist in N. and S. Dakota, where the grain has been tried at the experimental stations, and also by several farmers who have unanimously pronounced it a very satisfactory material to grow. In Manitoba (Canada) the grain has also been grown with excellent results, on account of its drought-resistant qualities and its freedom from the attack of rust, smut, and similar diseases.

Experiments are now being made for the determination of its value as a feeding-stuff for cattle, for which purpose it compares favourably with barley and oats, as the following analyses show:—

	Water.	Ash.	Fat.	Albuminoids.	Amides.	Dry gluten.	Starch.
Specimen I.—							
Kernels and chaff . . .	9.05	3.33	2.10	13.69	—	—	43.03
Kernels alone . . .	10.88	1.53	2.13	16.98	2.10	14.77	48.23
Chaff alone . . .	8.89	7.77	.60	4.88	.38	—	7.50
Specimen II.—							
Kernels and chaff . . .	8.57	2.83	1.50	13.43	.43	—	47.15
Kernels alone . . .	10.06	1.25	2.11	16.24	1.36	13.26	52.14
Chaff alone . . .	6.77	7.16	.71	3.71	.21	—	8.81

The grain has not been used to any extent in the United States as human food, but is so employed in Russia, where it is ground into a meal called "krupa," and used for making a kind of porridge (kasha).

In spite of its somewhat limited cultivation, a considerable number of varieties of emmer are already in existence, distinguishable by the colour of the chaff into red, white and blue-black groups. The varieties experimented with in America belong to the white chaff group, and ripen late in the spring.

Among other valuable features of emmer are the readiness with which it crosses with wheat, conferring on the latter its own drought-resistant qualities and non-liability to fungoid growth.

THE EFFECT OF SODIUM BISULPHITE ON LEATHER.

One result of the disappearance of forests in civilised countries has been to render the tanners of these countries dependent on external sources for tanning materials, and, so, large quantities of tannin-bearing barks, leaves, and fruits are annually imported into Europe from India, South America, and elsewhere. Recently it has become customary, in order to avoid the expense of carriage, to prepare extracts of these materials, and this industry has now assumed large proportions in India, the United States, Germany, Italy, Sweden, and other countries, including Great Britain. In the preparation of such extracts it is almost impossible to avoid the production of certain dark brown colouring matters by the long-continued heating of the aqueous liquors obtained during the extraction process, and as this colouring matter is absorbed by hide along with the tannic acid (producing a dark coloured leather), it is desirable that it should be removed. This object can be accomplished in various ways, such as the addition to the concentrated liquor of a certain quantity of raw blood, the mixture being subsequently heated until the albumen coagulates and floats to the top carrying with it the objectionable colour, or solutions of metallic salts may be added which, by forming insoluble "lakes" with the colouring matter, precipitate it in a form in which it is easily removed. These methods are, however, objectionable, since they involve the loss of a certain proportion of tannic acid, and in 1897 an improvement was introduced and patented by a German firm which depended for its efficacy on the bleaching of the colour by sulphur dioxide added in the form of sodium bisulphite.

Extracts decolourized in this way always possess a strong odour of sulphur dioxide, and this peculiarity has prejudiced English tanners against them, since it was assumed that this impurity would lead to the occurrence of sulphuric acid in the finished leather, which would, therefore, be brittle and of poor quality.

This subject has been investigated by Dr. J. Gordon Parker and Mr. A. Gausser, of the London Leather Industries Laboratory, and the results obtained were communicated to the Society of Chemical Industry and are printed in the current number of the *Society's Journal*.

The extracts made from mimosa and quebracho barks were first examined and found to contain sodium bisulphite and some free sulphurous acid; leather tanned with these extracts was then examined for its content of free acid, and in this respect was found to be normal and to contain no trace of either free sulphurous or sulphuric acids.

Specimens of brittle leathers supposed to have been produced by the use of extracts containing bisulphite of soda, which had been submitted by various tanners, were then examined, and the inferiority was found to be due not to sulphuric acid but to overtanning of the leather by the use of too concentrated liquors in the tanning vats.

It was also observed that the hide always absorbed a certain small proportion of sodium bisulphite, which was almost the same in amount whether the tanning liquors contained much or little of this salt, but the amount so absorbed, usually about .5 per cent., has no effect whatever on the quality of the leather eventually obtained. These results are of considerable importance, since by the use of such decolourizing agents it may be possible to utilize for the manufacture of tanning extracts, tanning materials containing what are at present objectionable colouring matters which preclude their employment in tanning.

LECTURES AND PAPERS.

"FACTS AND FANCIES ABOUT CANADA."

(By J. W. BENGOUGH, Esq.)

Sir CHARLES RIVERS WILSON presided, on the 11th November, at a lecture delivered at the Institute by Mr. J. W. BENGOUGH, entitled "Facts and Fancies about Canada." Mr. Bengough, who was formerly editor and cartoonist of *Grip*, the Canadian *Punch*, illustrated his lecture with impromptu crayon sketches; and Sir Rivers Wilson, in his introductory remarks, said that in the whole of His Majesty's dominions a colony having a larger claim upon the public interest of this country would be hard to seek. Englishmen generally, however, had much yet to learn about Canada, and Mr. Bengough was well equipped for the task of filling up such gaps as existed in their knowledge of this great country, which he—Sir Rivers Wilson—from the personal acquaintance he had with it, was certain had a prosperous future in store for it.

Mr. Bengough, after referring to the gratification it afforded him to address an audience at the Imperial Institute, said that the subject of Canada was, of course, too large a one for him to attempt anything like an exhaustive treatment of in the short space of one evening. He should only, therefore, endeavour, with the aid of his cartoons, to expose some few of the *fancies* which he found existed in the minds of the British public, whose ideas on many Canadian subjects were, even if correct, often very vague. What John Bull saw when looking across the Atlantic was often shrouded in fog.

The people of this country were, of course, well aware that Canada formed part of North America, but they had a tendency to confuse America with Canada, and to think of American as meaning Uncle Sam only. A boundary line, however, existed between the United States and Canada, "Uncle Sam was by no means the only pebble on the beach," which, roughly speaking, divided the Continent into two parts, the northern—Canada—being rather the larger of the two. The two nations had, of course, a common origin and language, but they differed in some important respects apart from their forms of Government.

The early history of the country, beginning with its discovery by Columbus, was fairly well known in England, although perhaps many people were unfamiliar with the war of 1812, which lasted three years, when the United States attempted to absorb Canada. Since that time the wars waged in the Dominion had been against the forces of nature. During the last hundred years Canada had grown from a wilderness to a beautiful and prosperous Commonwealth—a land of homes, schools, churches, factories, and shops, as well as of farms, mines, and ranches.

A glimpse of the true Canada of to-day had recently been given by a correspondent of one of the London newspapers, who had accompanied the Prince of Wales on his recent journey through the Dominion, and who, after eulogising its travelling facilities, had said that it was difficult to understand why more English tourists visited the United States than this beautiful and romantic country, where they would be under their own flag, and much more at home, and more in sympathy with the people, than they could be in a foreign land. At the autumn season of the year the climate of the Dominion was delicious, neither hot nor cold, and to breathe the keen pure air of the woodlands, prairies, and mountains was indeed exhilarating.

The climate misconception seemed very deep rooted in this country, where everybody was familiar with Kipling's *Our Lady of the Snows* and the *Miss Canada* of *Punch*. In many parts of Canada there was certainly plenty of snow, and there were many cold spells, in winter, but over large regions of the Dominion the winter did not last for the greater part of the year, and the wintry weather was not gloomy nor unpleasant, but on the contrary brisk, bright, and bracing. Mr. Bengough here recited a spirited poem, a reply to Kipling's *Our Lady of the Snows*, and, with reference to the *Miss Canada* of *Punch*, drew what he considered a much more applicable typical representation of Canada—a male figure, *Jack Canark*, suggestive of strength, youth, and enterprise, as exhibited in the Canadian lumberman, river-driver, and rancher.

Besides the misleading abundance of furs in the English representative pictures of Canada, Mr. Bengough referred to the Indian adornments so often also depicted. It would be easier, he said, to find Indians about the India House in London than round Toronto. Hundreds of Canadian children had never seen an Indian. The Indians "still in the business" were only to be found in the Far West, where they had no use for tomahawks or war paths.

Farming and stock-raising were the chief industries of Canada, although it was also a lumbering, mining, and manufacturing country. What it wanted was men and money. Why, said Mr. Bengough, (again quoting from a London newspaper), was it that Canada, a country of splendid natural resources capable of sustaining an enormous population, did not develop in the same ratio as the United States? Why was it that British Capital did not seek investment in civilised law-abiding Canada instead of going to some savage South American Republics, while the splendid farm lands of Canada, which could grow every pound of bread that Great Britain required, were, comparatively speaking, a vast solitude? Why, he continued, should not a few millions of British money be devoted to the development of cattle and wheat in Canada? Emigration from this country to the Dominion could not be the success it ought to be until capital went as well as labour.

The same practical conclusion, as to the importance to Great Britain of the Dominion as a food-producing region, had quite recently been arrived at by Mr. Rider Haggard in his articles on the results of his investigations on the condition of English agriculture, which pointed to the prospect of Britain being, before long, at the mercy of foreign nations for her food supply. Why not, in view of such a possible day, develop the food-producing Colonies and especially the nearest of them, Canada?

Great Britain found in the Prince of Wales a hearty co-operator in the carrying out of this policy of the building-up of Canada, and Mr. Bengough here quoted the following remarks His Royal Highness had recently made at London, Ontario: "We have seen enough to carry away with us lasting impressions of the vast resources of the Dominion . . . which will ever call for the steady reinforcement of suitable emigrants from the mother-land."

The Dominion was a great country for politics—a fact which would surprise many of those Englishmen who still thought of Canada as it was pictured in those venerable steel engravings by which British travellers, about the year 1806, illustrated the books they wrote of their travels in Upper Canada—that is of a forest country, with little clearings full of stumps, surrounding log houses, with wolves in the foreground, and a few wild Indians near at hand.

The Canadians took a great deal of interest in municipal and provincial politics, but it was of the wider politics that Mr. Bengough said he was more especially referring to, and the creed now held, universally, concerning them in the Dominion could be summed up into one brief phrase—the Unity of Canada and the unification of the Empire. To this policy there was no opposition, and it was advocated with equal fervour by both political parties. It was the general belief and desire of the Canadian people to maintain their position as part of the British Empire, and any sentiment for annexation that had existed was now dead, the prevailing feeling on this point being now all in the direction of Imperial Unity.

Mr. Bengough had a good deal to say about the views of those who still advocated annexation, and who had long since made up their minds that it was the manifest destiny of the Dominion to become a part of the United States. In this connection he referred to the fancy that he had found not a few persons on this side of the water to entertain, viz., that the Canadians looked forward with complacency, if not with pleasure, to this ultimate destiny of their becoming part of the United States. He did not know of any Canadian who so

regarded this question, but was certain that it would be impossible to find an annexationist in Canada amongst the leading men of any party or sect; indeed, so unpopular and repugnant was the idea, with the general public, that it would be impossible to elect a candidate, even for the humblest office, who was known to favour it. Annexation, continued Mr. Bengough, would never have the consent of Canadians unless practically every man in the country underwent a radical change, and the people became dissatisfied with the Canadian institutions and form of government, which, he said, they, at present, much preferred to those of the United States.

The Canadians had the utmost goodwill towards their neighbours. Inter-marriages were frequent. A million Canadians resided in the States, and many Americans in Canada, and naturally a good deal of commercial intercourse existed between the two peoples. There was also a decided tendency for the Canadians to import smart slang phrases from America, and in their general manners and customs they conformed much more to American ways than to English, yet these conformities and resemblances were, he maintained, only skin deep, and that essentially the Canadians were British, more British, if possible, certainly more exuberantly so, than the inhabitants of Great Britain itself. He was of opinion that the North American Continent would continue to be occupied by two friendly Powers, and drew a detailed and attractive picture of the mission the Canadians had in helping on the restoration to perfect friendship between the States and Great Britain.

He had also much that was eulogistic to say about Saxon unity. Canadian Unity and Australian Federation had both been attained, and Imperial Unity was now aimed at. Reference was also made to the many advantages to be derived from a re-arrangement of the fiscal relations between the different sections of Greater Britain in the direction of what was known as free-trade within the Empire; and a hope was expressed that Great Britain would assist in the building-up of Canada by sending men and money to that country, and by showing an increased preference for Canadian products. Mr. Bengough also dwelt upon the recent popularity of Canada in Great Britain.

To more forcibly bring home many of the points of his lecture he recited some of his own poems, notably one entitled *Able to feed the Motherland*. His cartoons, many of which he drew during the evening, were greatly appreciated by the large audience present.

Sir Rivers Wilson, in proposing the customary vote of thanks, said that he hoped the information which had been so well and agreeably given would go beyond the present audience, and would tend to diminish many of the misconceptions which still existed in this country with regard to Canada. He considered it a matter of regret and surprise that Englishmen did not flock out to that most beautiful, attractive, and productive country which Mr. Bengough had just described.

"THE BROWN COAL-BEDS OF VICTORIA, THEIR CHARACTERS, EXTENT, AND COMMERCIAL VALUE."

(By JAMES STIRLING, Esq.)

Professor E. HULL, late Director of the Geological Survey of Ireland, presided on the 18th November at a lecture delivered at the Institute by Mr. James Stirling, Government Geologist and Mining Representative of Victoria, on the "Brown Coal-beds of Victoria, their Character, Extent and Commercial Value." In a lecture which Mr. Stirling gave at the Institute about a year ago (see JOURNAL of January, 1901) on the "Coal Resources of Victoria," he gave some account of these brown-coal deposits. Since then, however, he has visited Germany, and other parts of the Continent of Europe, to study the latest methods there adopted of utilizing this class of fuel, and the most interesting portions of his lecture were those in which he described the information he had obtained on his journey. Professor Hull, in his introductory remarks, said he happened to be unacquainted with these brown-coal deposits of Victoria, and, therefore, looked forward with a considerable amount of interest to what the lecturer would have to say on the subject.

The question of utilizing the large deposits of tertiary fuel known to exist in the Latrobe Valley, Gippsland, at Newport near Melbourne, Lal Lal near Ballarat, Dean's Marsh near Geelong, and at other places in Victoria, to commercial advantage in the interests of the State was, said Mr. Stirling, of considerable importance at the present time, when each portion of the Australian Commonwealth was, so to speak, taking stock of its natural resources. He estimated that the State contained about 600 square miles of proved tertiary coal-beds, more than half of which occurred in the Latrobe Valley, which, as the main line of railway from Melbourne to Gippsland passed right through the district, was in direct railway communication with all the large industrial centres.

Detailed topographical and geological descriptions of the Latrobe valley were given. As a result of boring shafts, etc., at various localities, extending from Darnum on the west to Toongabbie on the east—a distance of nearly fifty miles—seams of brown-coal from 30 to 265 feet in thickness had been proved. At one place near Morwell a diamond-drill bore had been carried to a depth of 1,000 feet passing through several beds of the coal, three of which were 265 feet 6 inches, 227 feet 10 inches, and 166 feet 1 inch thick, respectively. Making due allowance for the fact, based upon geological considerations, that the deposits occurred as lenticular masses, thinning towards the end of the basins, old marshes, lakelets, etc. in which they were accumulated, and estimating that they covered an area of fully 340 square miles, there could not be less than 31,144,380,960 tons of brown-coal in the district, available at depths from surface to 1,000 feet levels. The cost of production of this material into briquettes, which should command a ready sale in Melbourne from 18s. to 20s. a ton, was from 7s. to 8s. a ton. A diagram of the Morwell bore was thrown on the screen, and Mr. Stirling dwelt at length upon the geological formation of the beds. There was, he said, evidence of extensive faulting of the strata since the older tertiary deposits and volcanic flows had been deposited, thus lowering the central part of the Latrobe Valley over the area now covered by the pliocene and later beds.

Approximate analyses of the samples at Mirboo Collieries, and of this Morwell bore, had shown clearly a general increase of the percentage of fixed carbon—heat-giving qualities—with the depth; in the former from 27 per cent. to 41 per cent. and in the latter from 26 per cent. to 48 per cent. Details of the results of several other bores, put down in the Latrobe and other districts, were given. The beds at Newport near Melbourne were 70 feet thick, and it had been suggested that they might possibly be utilized for the production of electrical energy in order to supply heat, light, and motive power to the metropolis. Deposits at Lal Lal, near the great mining centre of Ballarat, could, it had been suggested, be used for producing gas for smelting purposes, in a similar way to that now being carried out in Styria, and the deposits at Dean's Marsh near Geelong might also be turned to account for manufacturing purposes.

Referring to his recent visit to Germany and Austria, Mr. Stirling said that he was of opinion that the present development of numerous industries over large areas in those countries had been principally due to the methods employed for the economic production and utilization of this class of fuel. Its output was greatly increasing in both countries, even in direct competition with the older and more highly bituminous black coal. In N.W. Bohemia, tertiary-coal was used exclusively for locomotive purposes.

The main seat of the Rhenish brown-coal was on the uplands of the hills near Cologne, known as the Ville, in which there were about 18 brown-coal quarries and briquette factories, capable of producing nearly one and a-half million tons per annum. He had only had time to visit one of these works, in which 650 men were employed, winning about 4,000 tons per 24 hours. The cost of manufacture of a ton of briquettes from this material (including 7½d. for mining) was between 5s. and 6s. A description was given of the method of manufacture, and the machinery used. The briquettes for household purposes were 7 inches by 2½ inches

by 1½ inches, and smaller ones were made for industrial purposes. The output at these works during the time of his visit was 700 tons per day, which sold at Cologne at 15s. a ton. Special locomotives for burning brown-coal briquettes were constructed in Germany.

At some works near Halle, where the brown-coal was more friable and somewhat earthy in parts, two classes of briquettes were made: wet-pressed ones from the inferior and more earthy coal, which were dried in suitable sheds, and the more valuable dry-pressed ones, for manufactures and domestic fuel.

For the proper utilization of brown-coal, it was most essential that it should be carefully examined before being dealt with. Some kinds were suitable for the manufacture of briquettes, and others for the distillation of oil. Special attention was being paid to this fact at these works near Halle, where the distillation works, retorts, etc., were situated close to the briquette factory, so that the coal suited for mineral oil fabrication—which was selected after analyses of samples—was conveyed directly to the distillation retorts, where it was converted into tar, then into various oils, and finally into paraffin. The residue formed a commercially valuable coke, which was now being burned in suitable ovens all over Germany, for heating purposes. To emphasize the importance of subjecting brown-coal to scientific examination before treatment, Mr. Stirling quoted the results of some experiments with samples of Morwell coal, some of which had yielded as much as 30 gallons per ton, and others as little as 7 gallons. The coal containing the smaller amount of oil was, of course, the better suited for manufacture into briquettes.

In Austria the brown-coal industry was carried on on a large scale. In 1899 246 enterprises had been at work, employing 50,790 men, and producing 21,750,000 tons of coal, valued at nearly £4,000,000. Nearly half of this coal was exported, chiefly to Hungary, Prussia, Brandenburg, Wittenburg, Saxony, and Switzerland. The brown-coal industry of Hungary was also largely on the increase.

Recent experiments made in Germany with the Morwell coal had shown it to be superior to the average of that found on the Continent of Europe, while some samples, tested for tarry matter and oil, had proved superior to the average Scotch shales. It was said to be capable of manufacture into the following products:—

Briquettes, wet and dry pressed,
Various oils and paraffin,
Coke and pitch,
Colouring matters,
Gas,
Antiseptic soap,
Sheep-dip ointment,
Disinfectants, etc.

If the German methods of the utilization of this coal were adopted in Victoria the establishment of various industries all round the centres where the coal-beds occurred would, Mr. Stirling contended, be only a question of time, and the adoption of an energetic policy of promoting such production by the Government must, he considered, result in great commercial enterprise and industrial extension.

Professor Hull, in proposing a vote of thanks for a very interesting lecture, said that coal—mostly bituminous black coal—was now being extensively found in several of our colonies, and that Victoria was fortunate in possessing such large deposits of fine mineral fuel which, although only brown-coal, would seem to be of considerable importance to the State. He thought that Mr. Stirling was quite right in advising his Government to study, and adopt, the German methods of utilizing this class of fuel. Professor Hull also made eulogistic reference to Dr. Selwyn, who had been his first teacher in Geology, and also, as the first Government Geologist of Victoria, one of Mr. Stirling's predecessors.

"WESTERN AUSTRALIA.

"ITS PAST, PRESENT, AND PROSPECTS FOR THE FUTURE."

(By the Hon. H. B. LEFROY.)

The Hon. H. B. LEFROY, Agent-General for Western Australia, on Monday, 25th November last, delivered a lecture at the Institute on Western Australia. Sir GERARD SMITH, formerly Governor-General of the State, presided, and, in his introductory remarks, referred to the services Mr. Lefroy had rendered to the country as Minister for Mines during his term of office in the colony.

Western Australia, with a population of 200,000, was, said Mr. Lefroy, greater in extent than France, Spain, Portugal, the German Empire, and Austria-Hungary, with their 160,000,000 of people; and countries with which perhaps many of his hearers were more familiar than with this distant portion of their own Empire.

A short and interesting account of the early history of the country was given, which had practically began in 1829, when the British flag had been hoisted by Capt. Fremantle at the port now bearing his name. The progress of the country had, at first—until the discovery of gold—been but slow. A description of the Capital, Perth, of the harbour-works at the mouth of the Swan River, and of some of the institutions, specially those relating to its methods of government, was given.

The great industry of Western Australia at the present time was gold-mining, though side by side with it was prospering the cultivation of the soil, upon which, more than gold, depended the ultimate and permanent prosperity of the country.

Anyone who knew the goldfields of Western Australia by actual travel over the country, by observations made on the spot, and by wandering through drives and cross-cuts, and struggling up slopes, and not by operations on the Stock Exchange, must be struck by the marvellous developments which had taken place during the last eight years, the enormous area over which the auriferous deposits extended, and the wonderful possibilities the future held in store. The gold-bearing district reached from Kimberley, in the north, to Phillips River, in the south, a distance of over 1,000 miles in length with a width of more than 300. In spite of all that had been said to the contrary, he contended that the progress of gold-mining in Western Australia was without parallel in the history of gold-mining elsewhere. Compared with the progress of the Rand, during the first six years of its active development, Western Australia had shown a far better record; the total being three million ounces for the Rand, and four million for Western Australia. Again, Western Australia had been gradually and surely increasing her output, until, during the first ten months of the present year, (1901) she had produced 1,530,741 ounces, or nearly as much as the output for the whole of any previous year.

The first payable gold-bearing region in the country had been discovered in 1884 at Kimberley. Pioneers had then soon scattered afield and opened up new districts over hundreds of miles of territory, notably at Pilbarra, Nullagine, and Marble Bar, and in 1887 similar discoveries had been made in the neighbourhood of Southern Cross. Still, in 1892, shortly after the establishment of responsible Government, the value of the gold output had totalled only to £226,283. That, however, was the year of the rich discoveries at Coolgardie, where the outcrop of the reef had been found thickly studded with gold, and chunks of solid bullion were exposed "to the naked eye of those sturdy wanderers whose privations and exertions were so well rewarded."

This had created a rush to the shores of Western Australia from all parts of the world, and the beginning of her national prosperity, population, and wealth, really dated from that period. This influx also had been directly responsible for the opening up of what was known as the great auriferous belt of Western Australia. The difficulties with which the gold-miners of these early days had to contend would be readily understood, when one remembered that this district was situated some 400 miles from the sea-board, in a most inhospitable region, with but little animal life or water except such as was saltier than the sea.

Large areas of the country were soon pegged out under the Mining Laws, which permitted such, in blocks of not more than 24 acres, at an annual rental to the Government of £1 per acre.

On this wave had come the ubiquitous company promoter, and the mining expert from London. Good properties were discovered, although many of them had been retarded in their produce by over-capitalization, while some mines, placed in London and elsewhere, had never had an ounce of gold in them. People had thus lost their money and anathematized the country, although it really possessed great wealth and was capable, under fair and economic treatment, of yielding profitable returns to those who invested their money there in the gold-mining industry.

In the year following the discovery of the Coolgardie goldfields those of Kalgoorlie, 23 miles further east, commenced their existence. The Kalgoorlie group of mines—the Golden Mile—had proved itself to be the richest known spot on earth. At the present time Kalgoorlie was as up-to-date a town as any of its size in the world, and possessed fine buildings, well-laid-out streets, excellent hotels, and all the comforts of civilization; besides being connected, by an excellent train service, with the capital, Perth.

The value of the gold already extracted from the mines in this neighbourhood was over £12,000,000, the value of the machinery employed was estimated at over £1,000,000, and during last year dividends to the amount of £1,167,441 had been paid. These mines, which employed nearly 8,000 men and were responsible for a population of from 30,000 to 40,000, at depth continued to prove their richness, although the ores beneath the oxidised zone were more difficult of treatment. The processes of dealing with the sulphide ores were being gradually perfected, and splendid ore reduction plants had been erected. The Government Geologist, who had recently made a geological survey of the main Kalgoorlie belt, had stated that, geologically, there was nothing to prevent the lodes within the "Golden Mile" going down to any depth that man had ever mined.

Reference was made to several other districts where discoveries had been made, and auriferous country in various parts of Western Australia was now being prospected and in many cases payable mines opened up. Most of the holdings embraced in the large area of nearly 40,000 acres under lease throughout the colony for gold-mining were at present in the hands of small men, who, for the most part, were making a living and awaiting that capital which was so necessary for successful mining.

The country had produced, up to the present time, gold to the value of £28,000,000, and as yet the industry was only in its infancy.

Besides gold the country was rich in tin, copper and coal. These minerals were found in several localities; tin chiefly at Greenbushes in the south, and Marble Bar in the north; copper in the Mount Margaret and West Pilbarra goldfields; and coal at Collie, where the output for last year had been 118,000 tons, as against 54,000 tons for the previous year. The coal was being largely used on the railways and had proved also a valuable domestic fuel.

The progress of mining had been the progress of Western Australia. The population was now nearly six times what it had been in 1885; the revenue then had been £323,000, while for the current year it was estimated at £3,400,000. During the same period the value of the exports had increased from £446,692 to £6,852,059, and the imports from £650,391 to £5,962,178.

Although, however, Western Australia had achieved her present position mainly through the fascinating influence of gold, it must not be thought, said Mr. Lefroy, that her future was to depend upon it alone, as she possessed other and varied resources. Her forests, for instance, constituted a material asset of great magnitude, and covered an area of over twenty-four million acres, with a marketable timber said, a few years ago by a late Conservator of Forests, to be worth no less a sum than £124,000,000 after deducting one-third for waste in sawing.

The jarrah was the principal tree of the country, predominating in the extent of its forests and the various uses of its timber, the chief characteristic of which was adaptability for constructions necessitating contact with soil and water. The wood was practically indestructible and not attacked by the borings of the cheluria, teredo, or termite. Its resistance to white ants was remarkable, and houses built of it had been known to exist in perfect preservation for nearly 100 years. With age it became extremely hard and almost unworkable. When freshly cut its weight was a little over 70 lb. per cubic foot, but this lessened to 60 lb. when thoroughly seasoned. It was red in colour, comparatively easily worked when fresh, and polished splendidly. Some of the purposes for which it had been used were wood-blocking, piles, jetties, bridges, boat-building, posts, furniture and railway sleepers. Its remarkable suitability for piles, or any works requiring immersion in salt or fresh water, was well known in Western Australia. In the office of the Woods and Forests Department there were specimens obtained from piles and girders, which had been in use in local harbours and bridges for 60 years and were still perfectly sound and free from any sign of decay; if anything, indeed, the timber seemed more durable and solid than freshly cut wood. There were also instances of railway sleepers which, although laid down 18 years ago, seemed as sound as ever, and the records of fence-posts having lasted long periods in the ground were numerous.

The karri, the giant tree of Western Australia, and without doubt the finest and most graceful tree in the Australian continent, was the next most important commercial tree in the country. It was almost always straight in growth, and towered skywards for great heights without having even the semblance of a branch. The tree grew very rapidly, and its average height might be put down at 200 feet, with a diameter of 14 feet. This tree was the source of great wealth to the country and, owing to its lateral strength, which was greater than that of the jarrah, it was specially adapted for works which were required to bear considerable weight and strain. For street-paving it was said to be equal to, if not better than, jarrah. Both of these timbers were largely imported into London, and were also finding a market in South Africa, India, and elsewhere. Mr. Lefroy was of opinion that, where timber was required for street-paving, no other available for such purpose would be found, when properly laid, to surpass these indigenous woods of Western Australia for durability and usefulness. The exportation of timber generally was on the increase, and he considered that the forests would play a very important part in the future welfare of the country.

Pearl-fishing was another industry which, on the north-west coast, was being actively prosecuted, and had a distinctly bright future before it.

Besides these natural resources, Western Australia possessed large tracts of country suitable for the cultivation of all the food necessary to make the country self-sustaining. In the south-west were to be found large areas of rich fertile land which could be acquired on the very easiest of terms. Free farms of 160 acres were given away by the Government to persons owning not more than 100 acres, on condition that certain improvements were effected within given periods. The settler could turn his attention to either the growth of cereals, the cultivation of fruits and vegetables, or the raising of stock, for all of which the land was eminently suited.

Agricultural settlement had increased largely during the last decade. The area under crop, which had more than doubled, was said to be over 200,000 acres. For *bona fide* agriculturists there was ample room in Western Australia, where the question "who will buy my produce after I have grown it" could be more satisfactorily answered than in any other country. On the rich goldfields, where the limited rainfall would not permit the growth of agricultural produce except by the use of water artificially applied, there was engaged an ever-increasing population entirely dependent on outside sources for all their food supplies; and thus, linked by rail to the producing centres, was a large consuming population.

The production from the soil in Western Australia had not as yet been able to meet the demand, so that during last year the country had had to import from the Eastern States produce amounting to nearly £700,000 in value—less however by £200,000 than that of three years previous. The supply was now gradually catching up to the demand, although the latter was yearly increasing.

Western Australia, too, was noted for its fruit. Grapes, stone-fruits of every kind, oranges, lemons, apples, pears and many other fruits, with proper attention, grew as well there as in their native countries. The future of the wine industry especially was one of great opportunities, the soil and climate being particularly favourable for its successful prosecution. Practically the whole of the south-west division of the colony was adapted for viticulture, and already 100,000 gallons of wine had been manufactured locally in a year.

The position of the country as the nearest portion of Australia to the old world must, Mr. Lefroy contended, ultimately be an advantage to the intending vigneron, orchardist, or farmer.

The Government was doing everything in its power to assist settlement and open up the country. One thousand four hundred miles of railway had already been constructed in different directions. Telegraph lines had followed the prospectors even to the remotest mining camps. The face of the whole country was dotted with schools, wells, and dams; and tanks have been provided everywhere to supply the goldfields and other places with water.

A large reservoir had been constructed in the Darling Range, 23 miles from Perth, containing sufficient water to pump five million gallons daily to the Kalgoorlie and Coolgardie districts, a distance of nearly 350 miles. When the necessary connections were completed it was estimated that water could be supplied to these goldfields at 3s. 6d. per thousand gallons, or about 5 per cent. of the present cost of condensing water in those localities. All this had not been done without the expenditure of borrowed money, but such money had, Mr. Lefroy contended, been well laid out. A country with such unbounded resources warranted the outlay; and her railways, her large tracts of unoccupied country waiting settlement, and her increasing revenue, were noble assets to set against her small indebtedness of £14,000,000.

Mr. Lefroy, in his concluding remarks, said that he hoped his lecture might be the means of encouraging some of those present to take an interest in Western Australia, his country by birth, and one of which he felt he had every reason to be proud.

He showed some excellent slides illustrative of the mineral and agricultural resources of the country; and Mr. E. T. Scammel, the official lecturer on the resources of the colony, described, with the aid of photographic views, some beautiful stalagmite- and stalactite-caves recently discovered by Mr. C. Congrave near Cape Leuwin.

"THE COMMERCIAL ROUTES OF SIBERIA."

By CAPTAIN WIGGINS, F.R.H.S., ETC.

(ANGLO-RUSSIAN LITERARY SOCIETY).

At a meeting of the Anglo-Russian Literary Society on November 5, the president, Mr. E. A. Cazalet, in the chair, the well-known navigator and explorer Captain Wiggins, F.R.H.S., M.R.Y.G.S., etc., read an interesting paper entitled "The Commercial Routes of Siberia by Land, River and Sea," followed by the exhibition of a series of curious photographs.

In his introductory remarks, Mr. Cazalet mentioned Captain Wiggins' paper "The Kara Sea Route," read before the Anglo-Russian Literary Society in July, 1896, spoke of the useful work which the lecturer had done in opening out this famous route, which put Great Britain in direct communication with the River Yenesei and the heart of Siberia. The late Emperor of Russia had fully appreciated Captain Wiggins' exertions in this direction, and had presented him with a beautiful silver service in token of his approval.

The lecturer began with a description of the longest and most ancient of all known routes, the famous Siberian overland route, which had existed for centuries, even before the advent of the mighty Genghis Khan. It was intersected at the many different trading stations by numerous bye-roads leading to the far-off territories of Mongolia, Turkestan, and Persia in the south, and the desolate, but valuable fish- and fur-trading and gold-mining districts of the far North. Along these ancient roadways might still be seen thousands of caravans of merchandise-laden sledges or carts. Some of them were a beautiful sight, drawn by the finest horses of the land, with their bright sledges and harness; others on the southern roads, near the Mongolian or Kirgese Tartar countries, were more curious, being drawn by huge camels enveloped from head to stern in immense sacks or cloaks made of thick hair felt. Passing on to an account of the renowned trans-Siberian railway, the most triumphant engineering feat of our age, covering 8,000 miles, Captain Wiggins said that he had himself inspected the line and found all the most important work, such as the large bridges over the rivers, and the splendid cuttings through the gorges, and round the precipitous bends of the Oural Pass, of the most durable and efficient kind. Added to this the attendance and accommodation all along the line were more than adequate.

Finally, the lecturer dwelt at some length on the riverine routes of Siberia, showing how the great Obi, Yenesei and Lena were intersected by numerous tributaries, all running nearly at right angles to the main river system, which completed a lace-like web of valuable commercial riverine-transit, capable of being navigated by steamers in summer and valuable as sledge roads in winter. A mammoth ice-breaker steamer kept Lake Baikal open during the winter, and as this lake was intersected by the Selenga river and the headwaters of the Amoor, which in its turn was in touch with the trans-Baikal portion of the railway, steamers and barges were able to supply goods or receive produce from the shores of the Pacific Ocean. Added to all these natural waterways, canals are being constructed in order to connect the larger rivers.

In conclusion, the lecturer expressed the hope that before long the Russian Minister of Finance, M. Witte, would again tempt British merchants and mariners to make their voyages by the Kara Sea, by removing the embargo that he had lately placed upon goods entering Siberia by that route. The inhabitants would then once more enjoy the stimulating influence of cheap wares, etc., and would secure an easy transit for their own products to the European markets, instead of being subject to the expensive carriage earned by a powerful monopoly of Russia's overland merchants.

The exhibition of a series of excellent views followed the reading of the paper, and Mr. C. H. Moberly, C.E., who is well acquainted with Russia, sent some written remarks, giving a brief history of the attempts to develop communication between the European and Siberian waterways. In 1797, the first survey was undertaken of a line of water communication between the Obi and Yenesei. And already in the 16th and 17th centuries, Russian sealing vessels from Archangel and Kola went to the Kara Sea and found their way to the Obi and Yenesei, either through the Kara Sea or round the North of Novaya Zembla. But the first properly recorded voyage through the Kara Sea was the one made by Captain Wiggins in 1874. Recent data seemed to show that the route round the north of the islands was perhaps better than the southern one through one of the Straits and the Kara Sea, the cold being always more intense near land than in the open ocean. Mr. Moberly had personally, however, little faith in an Arctic route for regular trade. What was chiefly required to develop the resources of Siberia was to improve the waterways in the basins of the Obi and the Yenesei, and either to form an efficient canal route across the Ourals, or else to greatly increase the railway accommodation across these mountains so as to get the Siberian produce into Europe.

The meeting was brought to a close by a hearty vote of thanks to the lecturer, proposed by Mr. J. Wilson Swan and seconded by the Rev. Mr. Arthur S. Thompson, formerly British Chaplain at St. Petersburg, both of whom dwelt upon the spirit of enterprise and patient power of endurance displayed by Captain Wiggins in his useful and important voyages and explorations.

PROCEEDINGS OF INSTITUTIONS.

THE ROYAL GEOGRAPHICAL SOCIETY.

The opening meeting of the new session of the Royal Geographical Society was held on the 11th Nov. The President, Sir CLEMENTS MARKHAM, occupied the chair, and Sir HARRY JOHNSTON delivered an interesting lecture on "The Uganda Protectorate, Ruwenzori, and the Semliki Forest." After describing the various provinces of the Protectorate, he said that the traveller from Mombasa, before reaching the frontier of Uganda, passed through the country of Kikuyu, which was well forested and thickly clothed with vegetation. As he descended into the Rift valley the Kikuyu vegetation decreased in luxuriance. In the vicinity of Lake Naivasha there was a short sweet grass, which was probably kept low by the browsing of innumerable antelopes and the herds of Masai cattle. The Masai of the Naivasha district belonged to the essentially cattle-keeping, semi-nomad division of that race. Quite recently, for political reasons, it had been thought advisable to make the Masai dwelling within the eastern province of the Uganda Protectorate independent of any political connection with those of the adjoining East Africa Protectorate or of German East Africa. Unfortunately, at the present moment the Masai race was on the road towards extinction, either by dying out or by fusion with other tribes. The last year or so, however, there had been a marked increase in prosperity among the Masai of Naivasha, and he was therefore in hopes that in this region they might increase and multiply and preserve their purity of race. From the north-eastern buttresses of Mount Elgon, and the head-waters of the Weiwei river on the north, to the frontier of German East Africa on the south—a distance of about 240 miles—extended, at altitudes ranging between 5,000 feet and 10,000 feet, one of the most beautiful and healthful districts to be found anywhere in the Dark Continent. This lofty region he would style the Nandi plateau, as it was mainly inhabited, so far as it had any human inhabitants at present, by races of the Nandi stock. The scenery on the Nandi plateau reminded the homesick official and traveller, over and over again, of England, of Wales, of Scotland. This beautiful land had not in it a single ugly or unfriendly spot, and as it was almost entirely without native inhabitants it seemed to be awaiting the advent of another race which should make it a wonderland of wealth and comfort, a little England, half a Scotland, or a large Wales, lying exactly under the equator at an average altitude of 4,000 feet above the Victoria Nyanza, of whose silvery gulfs and ghostly mountain coastline strange glimpses at a distance of 90 miles might be caught occasionally from some breezy height, or through the interstices of woods which themselves might be in Surrey. He travelled completely round Mount Elgon. On its southern, as on its northern side, the awful mountain cliffs which marked one of the lower terraces of this tremendous crater were honeycombed with deep recesses or caverns. These were the well-known caves of Elgon, the caves which were first discovered by Joseph Thomson. He visited several caverns, but among others the one which was the first cave reached and discovered by Joseph Thomson, whose visit the natives still remembered vividly. The cave was marked by a splendid waterfall. It was the descent of the Sasuru river, and he would propose to name the waterfall the Thomson Falls. It was hardly necessary to add that Joseph Thomson left behind him there, as wherever else he passed in Central Africa, the most pleasing memories. Fate had ordained that he should often travel in Thomson's footsteps, and he had always noted that where Thomson had been the first white pioneer his admirable treatment of the natives had ensured a kindly welcome to those who followed. The native inhabitants of West Elgon were of the greatest interest. They were of rather a mixed stock, but all were of very low and ape-like appearance. The greatest interest they possessed lay in the fact that they spoke a Bantu language which, of all those discovered, possibly came nearest to the original form of the Bantu mother-tongue.

From the Sabei country he was obliged to travel for 16 days to the ravine station without a road, simply guiding his caravan by the map and eye. From the north-east of Elgon to within sight of the ravine station they passed through a land whose only human inhabitants were a few wandering and fugitive Andorobo—a land simply swarming with big game. They saw large herds of elephants first, then many rhinoceroses, then literally countless hartebeestes, water-buck, reed-buck, Cobus antelopes, bastard hartebeestes, and oribi. Herds of zebras would follow the caravan, snorting and kicking up their heels. There were lions, leopards, warthogs, jackals and many ostriches. Last of all, in the middle of the Gwas'Ngishu plateau, where forests of acacia still lingered, they came upon giraffe, upon that five-horned giraffe which appeared to be a new species of that remarkable animal, and apparently the common form of giraffe between Elgon on the west and Lake Baringo on the east.

After describing Busoga, the Baganda people, and the southern part of Unyoro, the lecturer said that he crossed the Semliki River opposite Fort Mbeni and travelled for three days in the dense Congo forest. He could fully endorse all that Stanley had said about the awesome nature of those appalling woods. He could only say that the whole of his expedition, as well as himself, longed to be out of them, although they were in search of the now well-known Okapi, and of other wonders, some of which were found, and some of which still remain undiscovered. He employed his time in this forest by visiting the Pygmies at home and seeing their little settlements of tiny huts constructed of withies and leaves. He also encountered there those strange prognathous ape-like people who seemed to be a race of pariahs dwelling on the fringe of other tribes. He also ascertained that the real gorilla comes pretty near to the Semliki in its distribution. He had reason to believe that other remarkable discoveries of hitherto unknown mammals would be made besides that of the Okapi. As it was, in that forest they obtained skins of several other beasts new to science. He was accorded the kindest hospitality by the Belgian officials, and given every possible facility for visiting that portion of the Congo Free State. He found the natives everywhere on friendly terms with the Belgian authorities, and the excellent roads and well-built stations, together with abundant supplies of the comforts and necessities of existence from Antwerp merchants, introduced a strange element of civilization into those otherwise trackless wilds.

The south-western part of the Uganda Protectorate consisted of the district of Ankole. A portion of that noble country rose to heights of 8,000 feet and 9,000 feet, and here reappeared the alpine vegetation of Ruwenzori, Elgon, and the Nandi plateau. Among these mountains were scattered almost innumerable crater-lakes, which provided landscapes of exquisite beauty. They nearly all contained fish. The scenery round these crater-lakes was so extravagantly beautiful that he felt that, coupled with the fact that they were in a country possessing a very healthy climate and few inhabitants, they might some time become the seats of small European settlements. The northern part of Ankole was somewhat drier and less equatorial in climate. It had a more parched appearance, at any rate during the dry season, and it fell in altitude. Here there was a certain amount of big game, including buffalo, rhinoceroses, and eland. The people of Ankole, as was well known, consisted of a race of sturdy negroes—the Ba-ito—and an aristocracy of Ba-hima, who were, as Speke, their original discoverer, guessed at once, obviously descended from a Gala, Somali, or other Hamitic stock. As regarded features and complexion, one often saw men and women among the Ba-hima who were more like Egyptians than was the case with the Galas and the Somalis. But, strange to say, the hair of the head was much more woolly and negro-like than was the case with Galas and Somalis. He had seen some men and women so light in complexion that he actually thought they were some of Emin Pasha's refugee Egyptians, until it was proved to him that they had been born and bred in Ankole. These people, no doubt, were the origin of many of the legends of a white race dwelling in Equatorial Africa. Among other points they were remarkable for their domestic cattle, which had more or less straight backs, were of large size, and had enormous horns. On the whole, the breed agreed

remarkably closely with the long-horned cattle depicted in the Egyptian frescoes, and he believed that this race was the stock from which the long-horned South African cattle were derived.

The lecturer concluded with an account of his exploration of the Ruwenzori range of snow mountains. He said that Ruwenzori was still the most mysterious and least known mountain in Africa, and it was certainly, of all African mountains of his acquaintance, that which was the most constantly cloud-covered. He was personally convinced that the highest point of Ruwenzori was not under 20,000 feet in altitude, and that it would, therefore, be found to attain the greatest altitude on the continent of Africa. When, after the most arduous climb he had ever experienced, he reached his highest point on the flanks of the snow range—14,800 feet—the mountain above him seemed a thing he had only begun to climb, and towered, so far as he could estimate, another 6,000 feet into the dark blue heavens. Permanent snow, however, lay as low as 13,000 feet. To effect a complete and successful ascent of the highest points of Ruwenzori required as elaborate a preparation as the exploration of the Andes or the Himalayas. An enormous deal remained to be done in the exploration of this, the most important range of Africa.

Sir Harry Johnston illustrated his lecture with a large number of beautiful lantern-slides made from photographs taken by himself, and created considerable amusement by reproducing by means of the phonograph specimens of native singing.

THE ROYAL AGRICULTURAL SOCIETY OF ENGLAND.

The usual monthly meeting of the Council of this Society was held on the 11th ult., PRINCE CHRISTIAN (president) in the chair.

The chief business before the Council was the settlement of the prize-sheet for the meeting to be held at Carlisle from July 7 to 11, 1902, under the presidency of Prince Christian. The recommendations of the various committees as to prizes to be offered on this occasion were submitted and, after discussion, adopted. The total amount of prizes offered in all departments, exclusive of champion prizes offered by the leading breeding societies, will amount to £6,001. 5s., to which the Carlisle Committee have contributed £1,250, and various breed societies £245. Mr. R. Neville Grenville was appointed a steward of implements, Mr. E. W. Stanforth and Viscount Baring stewards of stock, and Mr. G. H. Sanday, and Mr. F. S. W. Cornwallis stewards of finance for the Carlisle meeting.

Sir Nigel Kingscote reported from the Finance Committee that the financial result from the Cardiff meeting held last June was a surplus of receipts over expenditure of £1,998. 4s. 4d.

Mr. J. Bowen-Jones presented a report from the consulting chemist as to various cases of adulteration in feeding stuffs, and desired to draw the special attention of purchasers of common or undecorticated cotton cake to the increasing practice of putting borax and other chemicals into cotton cake in order to maintain the bright colour of newly crushed cake, which in the case of cakes thus treated passes off on keeping. Cakes thus treated should be avoided by purchasers.

The Hon. Cecil Parker presented a report from the Veterinary Committee with regard to recent outbreaks of anthrax, glanders and swine fever, and stating that the country now appeared to be free both from foot-and-mouth disease and rabies; the last case of the former having occurred on April 12, and the last case of the latter on April 22.

Mr. Richard Stratton moved a resolution expressing the views of the Council that it was highly important that the country should be declared free from foot-and-mouth disease. Mr. Crutchley said he understood that, although the country was actually free from the disease, there were some administrative difficulties about its being officially declared so. Mr. Bowen-Jones said it made a great difference to breeders of pedigree stock, because the Argentine Republic was closed until it had been declared that foot-and-mouth disease did not exist. The Sheep Breeders' Association had asked that this should be done, but up to the present the Board of Agriculture would not say that the disease had ceased to exist, although it had not appeared since April. After some further discussion the following resolution was carried unanimously, and ordered to be communicated to the Board of Agriculture:— "That this Council desires to draw the attention of the Board of Agriculture to the fact that no case of foot-and-mouth disease has been reported in this country since April 12 last, and to express the hope that, under these circumstances, His Majesty's Government may be able to see their way to officially declare the country free from the disease."

Mr. Crutchley reported that, since the constitution of the Site Committee at the Council meeting on November 6, they had had two meetings, at which instructions had been given for the fencing of the new show-yard in the metropolis, and various other matters connected with the site. The sum of £27,853. 3s. 6d. had been promised by 376 subscribers to the fund which the Society was raising for the purchase and equipment of the show-yard. Sir Nigel Kingscote pointed out that, although the amount promised was sufficient for the purchase of the land, it did not make provision for drainage, gas- and water-piping, fencing, and roads, or for the requisite buildings, such as permanent stabling and the more substantial structures of a show-yard. The committee would, therefore, be glad to receive further contributions towards the fund.

Various other reports from committees dealing with other departments of the Society's work were presented, and all the standing committees were reappointed for the ensuing year. Grants of £600 were made to the Veterinary Committee, of which £500 was allocated to the Royal Veterinary College; £200 to the Chemical and Woburn Committee for the expenses of the pot culture station at Woburn; and £400 to the Education Committee. Other business having been transacted, and the report of the general meeting having been settled, the Council adjourned over the Christmas recess until Wednesday, February 5, 1902.

THE AFRICAN SOCIETY.

At a meeting of the Council of the African Society held on the 13th ult., the following were duly elected Members:—

James Bell, A.I.N.A., Frank Norman Best, F.R.H.S., R. B. P. Cator, H.M. Judge East African Protectorate, Walrond B. Clarke, Albert Gray, George B. Hunter, J.P., L. Kentish Rankin, District Commissioner Northern Nigeria, A. D. Mackinnon, C.M.G., M.D., William Matthews, C.M.G., Mrs. Frank Melland, C. W. Perryman, J.P., James T. A. Stopford, Harry R. Tate, and Dr. A. Zimmerman.

At the same time the following gentlemen were proposed for election:—

Herr de Bloeme, Nieuwe Afrikaansche Handels-Vernootschap, Rotterdam; William Waters, S. M. Gluckstein, Editor of *West African Year Book*, S. Vaughan Morgan, F. Bohn, Co. Francaise de l'Afrique Occidentale, Marseilles; A. Guichard, Co. Francaise de l'Afrique Occidentale, Manchester; A. Pourrière, Co. Francaise de l'Afrique Occidentale, Liverpool.

Railways in Southern Rhodesia.—The *Board of Trade Journal* states that a despatch has been received from the High Commissioner for South Africa giving the following particulars relating to the railways at present being constructed in Southern Rhodesia:—(1) A line, 3 ft. 6 in. gauge, from Bulawayo, through Gwelo to the Globe and Phoenix Mine—150 miles long; (2) a line, 3 ft. 6 in. gauge, from Salisbury to the Globe and Phoenix Mine—150 miles long; (3) a line, 2 ft. gauge, from Salisbury to the Ayrshire Gold Mine, Lomagondi district—78 miles long; (4) a line, 3 ft. 6 in. gauge, from Bulawayo to the Gwanda district, Matabeleland—120 miles long; (5) a line, 3 ft. 6 in. gauge, from Bulawayo in the direction of the Wankies Coalfield and Victoria Falls—160 miles long. The Administrator of Rhodesia states in regard to the last of these lines that it is intended to extend this line through the Wankies Coalfield to the Victoria Falls, and thence across the Zambesi, but as the survey has not yet been completed, no contract for the extension has been given.

COMMERCIAL INTELLIGENCE DEPARTMENT.

CORRESPONDENCE AND ENQUIRIES.

The following are given as specimens of some of the enquiries which have been addressed to, and satisfactorily answered by, the Institute during the past month (December).

* * *All communications must be authenticated by the name and address of the writer. Enquiries which would involve special applications or expense will be a matter of arrangement with the correspondent.*

M. & Sons, Ltd., London.—Duty on carriages into New Zealand.
 P. W. L. A., Staffs.—Museums in the colonies.
 H. A. B., London.—General information on the colonies.
 L. R. K., London.—Flax-growing.
 E. F. P., London.—Engineers, boilermakers, etc., in the colonies.
 C. E. C., London.—Cultivation of pimento.
 F. A. G., London.—Obtaining valuation of various minerals.
 Verbal.—Victorian fibres.
 " New Zealand hemp.
 " Sheep farming in the Argentine Republic.

REQUIREMENTS REGISTRY.

In order to provide correspondents with an opportunity of making known special "wants" or "needs" in the British Colonies, India, and Foreign Countries, space will be regularly devoted to the publication of approved notices in the *IMPERIAL INSTITUTE JOURNAL*. Notices, as a rule, should not exceed 25 words in length, for which a charge of 2s. 6d. will be made for each insertion. Special arrangements can be made for longer notices.

SPECIMENS OF FOREIGN AND COLONIAL WOODS desired. Purchase or exchange. Names and localities must be well authenticated. Address—HERBERT STONE, BRACEBRIDGE-STREET, BIRMINGHAM.

THE CURATOR OF THE CANADIAN SECTION OF THE IMPERIAL INSTITUTE is prepared to furnish information about Canadian Trade and to supply names of importers, manufacturers, shippers, etc.

The following trade enquiries have been received at the Canadian Section of the Imperial Institute, from the Curator of which Section further particulars may be obtained:—

Home Enquiries.—A West of England firm of importers and manufacturers' agents could advantageously represent Canadian manufacturers of turned goods, boxes, hardwood blocks, brush backs, furniture seats, and hardware.

A London firm desires to hear from Canadian manufacturers of chair parts who can quote prices and fill orders.

A manufacturer of gelatines, greases, glues, etc., asks to be placed in communication with responsible Canadian importers of these articles.

Canadian Enquiries.—A Canadian manufacturer of wire mattresses asks to be placed in communication with United Kingdom importers who might be prepared to contract for regular supplies of these goods. Price lists furnished on application.

A Montreal house engaged in the metal trade wishes to secure the agency of a first-class manufacturer of steel rails, for which they report a good opening.

The Canadian owner of large timber properties situated in Labrador asks to be placed in communication with United Kingdom firms interested in the purchase of timber lands.

A Canadian company which has commenced the manufacture of wood flooring would be pleased to hear from United Kingdom buyers of this material.

A Canadian manufacturer who is about to undertake the production of mineral water wood caps seeks information regarding demand for these articles in the United Kingdom, and asks to be placed in communication with importers.

A Canadian manufacturer of church and school furniture of all kinds, chairs and other furniture, desires to be put in communication with United Kingdom importers of these goods.

A Canadian company which has commenced the manufacture of wood flour would be pleased to hear from United Kingdom buyers of this material.

A manufacturers' agent, who is established both in London and Canada, is in a position to represent a few United Kingdom houses who wish to develop trade in Canada.

A Canadian Canning Company is in a position to fill orders for canned vegetables, pork and beans, chicken, turkey, soups, etc., and asks to be placed in communication with importers of same open to place orders.

MAPS AND CHARTS.—RECORDS.

[The entire collection of maps (with the exception of a few atlases and maps issued by private firms) consists of authoritative publications of the various government cartographical departments. Such as: the One-inch Ordnance Survey of Great Britain and Ireland, a complete set of Admiralty Charts, and a selection from the maps compiled in the Intelligence Division of the War Office; the monumental "Indian Atlas," and a large number of the publications of the Surveyor-General's Office, Calcutta; the Geological Survey of Canada, and the Government Surveys of Victoria and New South Wales. In the arrangement of the collection, the geographical classification of the War Office Intelligence Department catalogue has, with some modifications, been followed.]

ADDITIONS TO THE COLLECTION OF MAPS DURING DECEMBER, 1901.

EGYPT.

MAP of EGYPTIAN SUDAN. No. 1489.—Sheets, Wadi Halfa, Murat, Kosha, Wadi Keheli, Dongola, Kagmar, Ma'atuk, El Obeid, Abba Island, Jebel, Fashoda, Middle Sobat, Nasser, Setit, Gore, and Akobo.
 BEBER to VICTORIA NYANZA.
 SKELETON MAP of SUDAN.

AFRICA.

I.D.W.O.

Presented by the Director of Military Intelligence.

WORLD.

W. & A. K. Johnston, Ltd.

"NAVY LEAGUE" MAP of the WORLD. This production is primarily intended to illustrate British Naval History. It shows British trade routes and steamship lines, with distances between various important ports, and includes statistical information regarding the wealth and social condition of the British Empire, the value of its sea-borne commerce, sources of its food-supply, etc.

Presented by the Publishers.

CHARTS AND PLANS.

Published by the Hydrographic Department, Admiralty, during September and October, 1901; J. D. POTTER, Agent, 145, Minorities, London.

No.

New Charts.

- 3192 Scotland, west coast:—Loch Broom, upper portion.
 3104 England, east coast:—Hartlepool to Blyth.
 3212 Ports on the east coast of Italy:—Port of Aneona.
 3197 Cuba:—Mevitas bay. Entrance channel.
 3213 Plans on the north coast of Brazil:—Port Timonha. Port Camocim.
 1921 Plans in the Indian Ocean:—St. Paul island. Amsterdam island.
 3214 Red sea. Suez bay:—Ports Ibrahim and Thewfik.
 1143 Anchorages in Malacca strait:—Wanderer bay. Arang Arang anchorage (*Republication*).
 3209 Bays and anchorages in Makassar strait.
 1578 Japan:—Simonoseki strait.
 3196 Harbours and anchorages on the west coast of Nipon, Japan.
 3200 Japan:—Aikappu Misaki to Rebun islands. (Plans:—Kabuka Biochi. Oniwaki Biochi. Teshio Gawa-Gashi.)
 3198 Russian Tartary:—Askold island to Cape Povorotni.
 3222 Russian Tartary:—Rikorda island to Larionoff point.
 1062 Australia, south coast:—Rivoli bay to Cape Otway.
 1014 Australia, south coast:—Cape Jervis to Rivoli bay.
 1383 Islands and anchorages in the south-east Pacific Ocean:—Juan Fernandez. Cumberland bay. Mas o Fuera island. St. Felix and St. Ambrose islands. St. Felix road (*Republication*).
 2194 Anchorages in the northern part of Celebes. New plans:—Bolang Uki bay. Sumalata road. Himana bay. Pienehang bay. Domisil bay. Paleli and Lintidu roads.
 208 Japan:—Harbours and anchorages on east coast Nipon. New plan:—Uchiura Wan.

Charts that have received additions or corrections too large to be conveniently inserted by hand, and in most cases other than those referred to in the Admiralty Notices to Mariners.

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| No. | | No. | |
| 1185 | England, east coast:—River Thames, Sea reach. | 592 | British Columbia:—Barkley sound. |
| 60 | Channel islands:—Alderney and the Casquets. | 2462 | Alaska:—Windham bay to Icy cape. |
| 117 | Færoe islands. | 713 | Mauritius:—Port Louis. |
| 2296 | Gulf of Bothnia:—South Quarken to Hornslandet. | 833 | Bay of Bengal:—Rangoon river and approaches. |
| 2302 | Gulf of Bothnia:—Tome point to Tauvö. | 1009 | Malacca strait:—Approaches to Perak river. |
| 33 | Germany:—Kiel fiord. | 2201 | Plans in Sumatra. |
| 2206 | Black sea:—Odessa bay. | 1153 | Celbes:—Pulu Mutwo to Tanjong Sutuno. |
| 2220 | Ports on the south shore of the Black sea. | 931 | Philippine islands:—Ports Subie and Silanguin. |
| 2216 | Turkish ports on the south shore of the Black sea. | 2734 | China, south coast:—Si Kiang or West river. Sheet 2. |
| 282 | Newfoundland:—St. John Bay to Orange bay. | 1270 | Korea:—Approaches to Chemulpho. |
| 1144 | Magdalen islands:—Grand Entry harbour. | 104 | Korean archipelago, southern portion. |
| 2029 | Prince Edward islands:—Cardigan bay. | 2877 | Japan:—Uwajima bay. |
| 519 | Lake Huron. | 1055 | Australia, west coast:—Bedont island to cape Cuvier. |
| 334 | Lake Huron:—Straits of Mackinac. | 2747ab | Australia, south coast:—Entrance to Port Philip. 2 sheets. |
| 2522 | South America, east coast:—Santa Catharina island to Rio de la Plata. | 105 | Tasmania:—Port Hobart. |
| 2887 | United States, west coast:—San Pablo and Suisun bays. | 2922 | Australia, east coast:—Turtle group to Clarendon point. |
| | | 2532 | New Zealand:—Ninety Miles head to Otago. |
| | | 1417 | South Pacific:—Chatham islands. |

HONG KONG.

In the annual report on Hong Kong, the Governor, Sir H. A. Blake, refers to the sound financial position of the colony, and states that its business, which is mainly that of a great transshipping port, continues to increase with the expanding trade of the East. Referring to the Boxer troubles, the Governor points out that Hong Kong was practically the British base, and incidentally states that the conduct of the Indian troops landed there left nothing to be desired. A paralysis of general trade was caused by the outbreak of hostilities, and the godowns in Hong Kong and Shanghai were filled to overflowing with imported merchandise, of which the Chinese merchants were slow to take delivery. The Governor refers to the outbreak of plague at the end of February, which lasted twenty-seven weeks. There were 1,080 cases, and the mortality was 95.5 per cent. A severe typhoon in November is also reported, during which H.M.S. *Sandpiper* and a large new dredger from England were sunk. Ten launches and over 110 junks were also wrecked, and more than 200 lives were lost in about three hours. In consequence of the difficulties which beset them on account of the strained interpretation by the Imperial Maritime Customs of the inland navigation agreement, the Governor points out that the large river steamers which traded between Hong Kong and the West River Treaty Ports were withdrawn during the year.

Regarding the revenue of the colony, the Colonial Secretary at Hong Kong states that a steady increase has been shown during the past five years, which has more than counter-balanced the increased expenditure. In 1895 the balance of revenue over expenditure showed a deficit of 486,144.12 dollars. In 1900 not only had this deficit been made good, but, notwithstanding an expenditure exceeding that of 1895 by 655,904.12 dollars, the revenue of Hong Kong showed a surplus of 574,140.37 dollars. The actual revenue for 1900 was 3,235,329.61 dollars, exclusive of the amounts derived from land sales and the water account, which amounted to 816,222.92 dollars and 151,034.87 dollars respectively. The expenditure amounted to 3,623,447.13 dollars, of which 473,205.89 dollars was on public works extraordinary. The total import trade of the port for 1900 amounted to 23,205 vessels, of 8,626,614 tons, carrying 6,342,138 tons of cargo, of which 4,198,389 tons were discharged at Hong Kong. This does not include the local junk trade. The net increase in imports thus amounted to 422,717 tons. In exports there was a decrease of 70,666 tons. The chief articles of import are coal, rice, sugar and flour; tea, kerosene, rice and paddy, and general cargo are the principal exports. There has been a great increase in the amount of sugar imported, no less than 76.6 per cent.; also in timber, coal, flour and hemp. The trade in bulk oil is almost at a standstill, but case oil shows a decrease of 10,609 tons. The rice trade has diminished by 98,801 tons, and may now be said to be at its normal condition. The population of the colony, at the census taken in January, 1897, was 248,880, while at the census taken in January, 1901, it was 283,975, exclusive of the army and navy, which amounted to 13,237. The population of the new territory, which is exclusively Chinese, was estimated at 100,000 in the year 1899.

New docks are projected, one of which will accommodate the largest ship afloat, and the existing docks are being enlarged, so that "the docking facilities of the port will in the near future, equal, if not exceed, those of any port in the East." The building of steam launches proceeds apace, and the Governor doubts whether better or cheaper launches are built in any part of the world. The enormous traffic of the colony renders it peculiarly difficult to deal with the introduction of the plague from without, especially as a few hours brings crowds of coolies from the neighbouring plague-infected mainland. Overcrowding is one of the pressing problems of the time; in one district the population is 640,000 to the square mile, and this in a city crowded under the precipitous northern slope of a range of hills that effectually shut off the south-easterly breezes of the summer months. The main difficulty is that the value of houses and land is so great that the opening of new streets must be very costly; nevertheless, "sooner or later the question of the abatement of surface overcrowding must be vigorously dealt with."

JOHOR.

The following information respecting the State of Johor has been recently received from the Hon. Dato J. Meldrum, the Corresponding Agent of the Institute:—

JOHOR.—Until the projected railway is made through Johor and connected with the railways of the Federated Malay States and the line from Singapore (14 miles) is finished, no great developments, such as have been made in Perak, Selangor, Pahang, Negri Sembilan, etc., may be expected. Land for new gambier and pepper plantations is not to be had near the water; besides, it is difficult to procure Chinese coolies, owing to the high rate of wages prevailing in the tin-producing States of the north, and other reasons.

The population may be said to be about 200,000, mostly Chinese. No census has ever been taken. The few Malays that govern the country are, perhaps, as well qualified for the task as their neighbours. There are a few British subjects, not more than thirty including children. It is now forty-one years since the first European came here to make it his place of permanent residence: he erected the Johor Steam Saw Mills (which are still actively employed). A few years afterwards, in the sixties, the late Sultan Abubakar came to reside; he built an istana and the town of Johor Bahru or New Johore sprang up; his father, the Tumpongong of Johore, resided at Telloh Blanga in Singapore. The present Sultan Ibrahim (a tall, handsome young man 26 years of age) is at present on a tour through the Continent of Europe.

According to the official statement of imports and exports issued by the Government of the Straits Settlements for the year 1900, it appears that the exports from Johor into

Singapore amounted to \$9,697,310; this included bullion, specie and silver coin (dollars) valued at \$270,937. The principal articles were gambier, pepper, sago, tapioca, manufactured and raft timber, rattans, tin ore, fish, fruits, coffee, areca nuts, copra, preserved pine-apples, gutta percha, etc.

The imports from Singapore into Johor amounted to \$6,241,403, including silver coin to the amount of \$3,021,615, so it is stated. The chief imports were fish, rice, poultry, swine, grains, flour, provisions, sugar, tea, tobacco, oils, manufactured articles, cotton goods, hardware, iron, joss paper, lime, tools, matches, machinery, beer, spirits, gunpowder. Opium, from which the revenue is chiefly derived, is not mentioned, neither is copper coin—nor various other items—many of foreign make. When the Trans-Continental Railway from Adelaide to Port Darwin is finished (2,000 miles) and the line from Singapore to India (1,600 miles) is made, Johor will participate in the advantages and possibilities that Singapore will enjoy in, it is to be hoped, the near future.

NEW BOOKS, etc.

CASSELL AND COMPANY, LIMITED. (London, 1901.) *The Earth's Beginning.* By Sir ROBERT STAWELL BALL, LL.D., F.R.S. With four coloured plates and numerous illustrations. 8vo., pp. 384. (Price 7s. 6d.) The author of this attractive book is well-known for the excellent lectures he gave to a juvenile audience at the Royal Institution during the last winter, in which he presented his hearers with a clear and popular exposition of that branch of astronomy which treats of the evolution of the earth, the planets, and the sun from the primitive "fire-mist." With some omissions and additions these lectures are set forth in the present volume, which will be read with much pleasure by all who are interested in the subject. To bring the stupendous facts and intricate problems of astronomy within the comprehension of children is no small intellectual feat, and the striking and familiar illustrations with which Sir R. Ball elucidates his discourse add greatly to the interest of the work. The book is written in a popular style with very few technicalities, so that the theories mentioned may be grasped readily by non-scientific readers. The doctrine of the evolution of our solar system from its nebula is well and clearly stated, and a graphic description is given of the volcanic eruption of Kra-Katoa in 1883, of which two artistically coloured illustrations are inserted in the volume. The study of astronomy does not receive the attention it deserves as a means of correcting wrong conclusions regarding the universe which are often met with. There are still many ill-educated persons who believe that the earth is flat, and who have but very vague notions of the firmament around them. The late Mr. R. Proctor did much to popularise the study, and to dissipate false ideas, but Sir R. Ball has presented the subject in so pleasing a manner that his book cannot fail to arouse the keenest interest, and to induce its readers to pursue further the study of this fascinating and wonder-revealing science.

CHARLES GRIFFIN AND COMPANY, LTD. (London, 1901.) *Year-Book of the Scientific and Learned Societies of Great Britain and Ireland, 1900-1901.* Eighteenth annual issue. Compiled from official sources. 8vo., pp. 347. (Price, 7s. 6d.) The issue of this Year-book has been made to coincide with the termination of the sessional year (September to June) instead of with the calendar year, as heretofore. The present edition has therefore been enlarged in order to fill the gap of six months which would otherwise have been created, and the lists of papers now given comprise, with few exceptions, those read before the various Societies during the eighteen months which have elapsed since the last issue, viz., January, 1900 to June, 1901. This alteration will be most useful and increase the value of the Year-book as a work of reference to those engaged in literary and scientific work.

HAZELL, WATSON AND VINEY, LTD. (London, 1902.) *Hazell's Annual for 1902; a Cyclopaedic Record of Men and Topics of the Day.* Revised to December 6th, 1901. Edited by W. PALMER, B.A. (Lond.). Seventeenth year of issue. Sm. 8vo., pp. 732. (Price 3s. 6d.) This well-known and most useful annual makes, as usual, an early appearance, and is quite up to date in all respects, showing the same careful editing as in previous issues. The present edition is greatly improved by a re-arrangement and consolidation of the articles relating to foreign countries. New articles have been inserted on the Armies and Navies of the World, the Trade of the World, the Mercantile Marine, Minerals, Railways, Industrial Trusts and Engineering schemes of the World. New Maps are given of the North-West frontier of India, showing clearly Russia's position with regard to Afghanistan; of Turkey and the Balkan peninsula; and of the projected Isthmian Canal routes in Central America. An article on the Triple Alliance sums up the known facts with regard to that combination of Powers which has been, and will be, much discussed in connection with the new Customs Tariff of Germany and the approaching expiration of the European Commercial Treaties. The important events in China during the year are recorded, and the Peace Protocol is given in full; the substance of the Canal Treaty with the United States is also inserted. Colonial affairs have received a large share of attention. The constitution of the Australian Commonwealth and a description of the inauguration ceremony will be found under "Australia," and the tour of the Prince and Princess of Wales and their reception by the Corporation of London on December 5, are duly recorded. New articles on home affairs have been added to the book, such as the Coronation Ceremony of 1902, the new Civil List, the 1901 Census, Factory and Workshop Act 1901, etc. Nothing of any importance has been omitted. The quantity and variety of information to be found in this Annual render it unrivalled as a work of reference; it has become indispensable both to the politician and the writer, and will be found a most useful desk companion.

HIND, HOYLE AND LIGHT, LTD. (Art Publishers, Manchester, 1901.) *Port of Manchester; a Sketch of the History and Development of the Manchester Ship Canal and Formation and Growth of the Cotton Association.* By W. BURNETT TRACEY. Folio, pp. This handsomely illustrated volume presents an excellent idea of the magnitude and importance of the Manchester Ship Canal, a work which has contributed and will continue to contribute greatly to the prosperity of the city. A special chapter of the volume deals with the rise and growth of the Manchester Cotton Association, which benefits largely in the direct importation of cotton by means of the canal. The engineering details of the work of constructing the canal have been written by Sir E. Leader Williams, the engineer-in-chief, and now consulting engineer to the company, and two introductory articles are given, one by Mr. W. H. Linton on the movement and its pioneers, the other by Mr. F. E. Cornwall on the early pioneers of the ship canal. The history and development of the canal are well recounted by Mr. Tracey, and this book forms a splendid souvenir of one of the greatest engineering feats of modern times. The illustrations, which are all from photographs, are admirably produced; the printing and binding are all that could be desired.

JOHN MURRAY. (London, 1901.) *The Growth of the Empire, a Handbook to the History of Greater Britain.* By ARTHUR W. JOSE. With 31 maps. 8vo., pp. xv. + 422. (Price, 6s.) This book was first published in Sydney, and already several editions of it have appeared in Australia. It is written by an Australian, and contains a concise account of the growth and development of the British Empire from its beginning in the time of Elizabeth down to the present day. The subject is of too vast dimensions to be fully discussed within the compass of a single volume of 400 pages. To those who have not time to peruse more lengthy histories, the book will convey a very clear and interesting account of the colonisation of various parts of the globe by the British race. This history has often been written, but, as in Mr. Jose's work it is viewed from a special standpoint, it contains much that is new and informing. The last chapter is perhaps the most important, as it gives the author's views respecting recent imperial developments. An appreciative note is made with regard to the statesmanship of Mr. Cecil Rhodes, as displayed in the extension of British power in Africa, and the formation of a British South Africa dominion. The author concludes by saying that at last we begin to see

the scheme of the Empire. "India is the central motive of its expansion. To reach India our adventurers threw themselves upon America; to guard Indian trade we seized South Africa; upon India converge the routes that are dotted from end to end with our forts and coaling stations. The Empire means that we are a stage beyond the rest of the world in national evolution. We, of the English-speaking communities, have been set to build this new structure, this house among tents; that we build it rightly and maintain it undisturbed is work necessary not only for the safety of the Empire, but for the orderly development organized." A list of colonial articles of the more important treaties to which Great Britain has been party, is given in an appendix to the volume, and numerous outline maps, which are well and clearly drawn, are inserted to illustrate the text.

WITHERBY AND CO., London. *The Royal Navy List, Diary and Naval Handbook for 1902.* Issued in conjunction with *Lean's Royal Navy List*. La. 8vo., pp. 120 + 408. (Price 3s.) This useful Diary and Handbook contains much valuable information respecting the Royal Navy and nautical matters, with a calendar of notable naval events, and a complete obituary for the year. Mr. L. G. Carr Laughton has again contributed an article on the Naval Progress of the Year, which is accompanied by a comparative table of battleships of the Naval Powers. This is the fifth annual issue of the Diary and Handbook, its compilation has been carried out with much care and attention with a view to correctness and reliability, and as a work of reference and record it will be of great service to all connected with the Navy.

The Journal of the African Society. (MACMILLAN AND CO., London.) We have received a copy of the initial number of the *Journal of the African Society* (October, 1901). This Society has recently been founded in commemoration of the work of the late Miss Mary Kingsley, to investigate the social condition of the native races of Africa, and to facilitate the commercial and industrial development of the continent in the manner best fitted to secure the welfare of its inhabitants. The *Journal* of the Society has been issued in furtherance of these objects by collecting and publishing information received from competent writers, and, judging from the articles contained in the first issue, it appears likely to meet with great success. The number commences with an appreciative tribute to the genius of Miss Mary Kingsley and her work in West Africa, written by Mrs. J. R. Green. Sir H. H. Johnston contributes some notes on African subjects of special interest, and Dr. Hagberg Wright gives an account of German methods of development in Africa, showing the advantages of Government aid and direction in fostering the growth of rising colonies. The article on British trade with West Africa, by Mr. J. W. Root, indicates the value and importance of this market to British merchants. The experiment of giving a vote to the natives of Senegal is amusingly described by Mr. Pierre Mille, and this is followed by "Some glimpses of West African Law and Custom," by Colonel Stopford, and a well-written account of "Taveta Customs," by Mr. Claud Hollis; while Major Spielsbury records his observations made during a journey with an expedition from Port Amelia, in Delagoa Bay, to Lake Nyassa, in August, 1900. It will be seen from the foregoing that the contents of the *Journal* are both varied and attractive, and it should prove most useful in spreading a better acquaintance with the inhabitants of the Dark Continent and their habits and ideas. Many of the troubles that have arisen with the natives have been owing, in a great measure, to not knowing how best to deal with them. The African Society will be doing good service in removing this ignorance.

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MONTHLY COMMERCIAL AND INDUSTRIAL SUMMARIES.

GENERAL COMMERCE AND INDUSTRY.

UNITED KINGDOM.

British Corn.—The following statement gives the average price of British Corn during the four weeks of December, 1901, as compared with December, 1900:—

1900.			1901.		
Wheat.	Barley.	Oats.	Wheat.	Barley.	Oats.
26/10	25/11	17/4	27/1	26/7	19/-
26/9	25/7	17/1	27/2	26/8	19/3
26/7	25/7	17/2	27/7	26/8	19/8
26/4	25/10	17/2	27/7	26/8	19/10

Enquiry into Foreign Methods of Commercial and Industrial Education.—A movement is on foot to send out a commission of enquiry to investigate methods of education on the Continent and in America, with special regard to their bearing on questions of commerce and industry. Mr. Alfred Mosely, C.M.G., who has been struck in the course of his business experience by the fact that Englishmen are very frequently less well prepared than Germans or Americans for the tasks of commercial and industrial life, is disposed to attribute this inferiority of equipment to differences of school training. Conscious, however, of the great complexity of the problem and of the variety of factors which need to be taken into account in any consideration of it, he proposes to defray the whole expense of a commission of enquiry, which would visit parts of the Continent and of America to study the question.

A number of gentlemen met under the presidency of Lord Reay, Chairman of the London School Board, to confer with Mr. Mosely as to the organisation of the enquiry; amongst them being Sir Joshua Fitch, Sir A. L. Jones, K.C.M.G., Mr. Sidney Webb, and Dr. W. Garnett (Chairman and Secretary of the Technical Education Board of the London County Council), and Mr. Graham Wallis (Chairman of the School Management Committee of the London School Board). It was decided that the enquiry should take place in the autumn of 1902. It is understood that the promoters of the enquiry will endeavour to secure the co-operation of a number of public men representing various types of educational authorities and also the interests of industry and commerce.

COLONIES.

Canadian Tinned Fruits.—Reuter states that the Canadian Packers' Association has determined to adopt active measures to develop the trade in canned fruits and vegetables of Canadian growth and manufacture in Great Britain. Stores for their sale will be opened in the leading centres in England, Scotland, and Ireland, and energetic efforts will be made to bring Canadian canned goods to the attention of British buyers.

Canadian Wood for Paving.—There seems likely to be a demand in the near future for Canadian wood for paving in England. The city engineers of Westminster and Liverpool, as a result of recent experiments, have pronounced in favour of Canadian tamarac and white spruce, and a number of authorities in other cities endorse their opinion. Canadian red pine is also recommended, and is pronounced to be equal to and cheaper than Baltic red wood. Some Canadian blocks laid in Trafalgar-square in 1896 have been found quite sound after five years, and worn away only $\frac{3}{8}$ of an inch on the average. Mr. Rust, city engineer for Toronto, says cedar has been found the best adapted of Canadian woods for street paving, but the tamarac and spruce of the maritime provinces are harder than what is found in the West, and the supply for export to Britain would naturally come from there. The wood is treated with creosote before being laid.—*Canadian Engineer.*

Export of Canadian Horses.—The export of horses from the United States has risen in value from 3½ million dollars in 1896 to 7½ million in 1900. Commenting on this rapid growth, the *Canadian Gazette* remarks that Canada has the same number per thousand of the population as the United States, and should have sent abroad during the last six years in round figures 245 thousand horses and have received 30 million dollars for them, or, according to Premier Ross, half the value of the horses in Ontario. Our contemporary urges that more attention should be given to the export of horses from the Dominion, and suggests that the Canadian Government should introduce legislation for the improvement of horses and cattle, in Canadian no less than in Imperial interests, by giving prizes and subsidising Canadian bred and imported stallions and sires of registered stock of other breeds; also, wherever necessary, by placing these or their progeny at free service in those districts where the stock is bad or where the farmers are too poor to help themselves. Although late in the day, by putting a stop to the use of "scrub" the trade may yet be rescued. Canada's only chance of successfully competing with other countries is by improving the whole of the live stock of the Dominion.

INDIA.

India and East African Trade.—EXHIBITION IN BOMBAY.—With a view to bringing before those interested in the Bombay cotton and spinning industries the desirabilities of accepting the East African coast as a new market for their wares, the committee of the Bombay Millowners' Association held an exhibition of textile fabrics imported from East African ports. The exhibits comprised sheetings, and a large variety of plain and coloured prints used for the making up of such clothing as is worn by Somalis and other races inhabiting the coast and the neighbouring islands. The fabrics from these markets were mainly of American and German manufacture, with here and there a sample of goods exported from England or Holland. The sheetings shown were almost all of American make, while the Germans were shown to have the best hold of the coloured print trade. Each exhibit was carefully marked with its source of manufacture, the purposes for which it was used, and the selling price in the particular market from which it had been obtained, which details afford those connected with the Bombay mills an opportunity of arriving at a conclusion in regard to the point now being brought to their notice, namely, that there is an opening for them to manufacture locally articles similar in design and workmanship to those on exhibition, and at a price that, after allowing for freight across the Indian Ocean, should enable the goods to be landed in Africa at prices much lower than those ruling in those markets for American and Continental fabrics.

FOREIGN COUNTRIES.

American Bank in St. Petersburg.—For some time there have been rumours of the founding of an American Bank in St. Petersburg. These rumours have now been substantiated. The syndicate of American capitalists will supply the new bank with a capital of 6,000,000 dollars, and the bank will be called the American Bank of the North.—*Constantinople Chamber of Commerce Journal.*

American Trusts and Mexico.—The North American Trusts are making themselves felt in Mexico in a most important fashion. Since the beginning of autumn of this year proposals have been made by New York firms to the most important mines in Mexico for handing over their business to a syndicate, which has already absorbed most of the smelting works; the breweries will also soon be monopolised by an American company, and the same also applies to the Mexican tobacco cultivation, the products of which are largely used in Hamburg and Belgium. In petroleum, shoe manufactures, tanneries, etc., the American interests are the most powerful, and, lastly, the English owners of shares in Mexican railways are in negotiation with an American Trust which desires to possess their shares.—*Handels Museum.*

Argentine Republic.—INDUSTRIES.—It appears from the Buenos Ayres *Herald* that Argentina has advanced beyond the pastoral stage, and is manufacturing a fair quantity of the goods it used to import. Now it not only grows wheat for export in great quantities, but it has flour mills which produce a good article for the home market. It has not only the wool, but wool fabrics as well. To-day blankets made in Argentine factories from Argentine wool are really the standard article in the market, and the imported article finds a sale only among those whose pocket-books are long. The country is making cotton fabrics, it having been found profitable to import the fibre or yarn for that purpose. Both in wool and cotton pretty nearly everything in the line of underclothing may now be had of Argentine make. Imported duck, indeed, is now almost an unknown quantity, having been widely supplanted by the home product. But the list of new and multiplying national industries does not end here. Breweries and distilleries are so numerous and self-evident as not to cause a special mention. Argentina is even making the bottles and demijohns in which the products are distributed. It is making the greater part of the porcelain-covered iron ware that is so common in every house. It is becoming a large manufacturer of boots and shoes of all kinds, though as yet it has no records to boast of in the way of tanning leather. Its hides go abroad, are there tanned, and the latter comes back to be made into shoes. Even ice, which formerly was imported by the shipload, is now an artificially produced home product, and that at a price much less than what it used to be.

Bulgarian Commercial Correspondents.—It is reported from Sophia that the Bulgarian Ministry of Commerce has resolved to appoint Commercial Correspondents in the great European trade centres, and as soon as possible in Austria and Hungary. These correspondents are to be selected from the well-known and respectable commercial classes. Some are to be appointed directly at Buda-Pesth, and it will be their duty to keep the Bulgarian Government informed as to the course of trade, and to forward the use of Bulgarian products. The Government has already appointed such officials in Paris, Odessa, and Antwerp, under the name of Bulgarian Trade Agents, and the present Minister of Commerce proposes to considerably extend their number.—*Handels Museum.*

Japanese Cotton Examination Bureau.—The Chamber of Commerce in Kobe has made a proposal to the Japanese Government to establish a bureau for the purpose of examining and classifying cotton. Amongst the hundreds of thousands of bales of cotton which are annually imported into Kobe there are a large number of inferior quality, and the difficulties which importers are caused in consequence, are proposed to be lessened by the work of this bureau.—*Handels Museum.*

Japan.—SHIPBUILDING.—The Japanese shipbuilders have made a favourable advance in recent years, as demonstrated by the fact that they build ships not only for use in their own country, but also some of large tonnage for foreign nations, as for instance a steamer of 700 tons register for the Customs Department at Shanghai. Still, in 1899, the number and tonnage of ships built in Japan (112 ships with a tonnage of 20,375) was smaller than that of those which were constructed abroad for Japan, namely 271 ships with a total of 39,847 tons.—*Handels Museum.*

Mexican Commerce.—Recent reports show that the commerce of this country is making rapid strides. The total value of the imports and exports has risen from 397,139,582 fcs. in 1894-95 to 683,506,882 fcs. in 1899-1900. During this period of six years, imports have increased 44 per cent. and exports 39 per cent. Most of the imports come from the United States, with an amount of 31 million gold pesos, then from England with 10½ million, then come France and Spain. It is evident that Mexico, with a population of 13 millions, which has enjoyed peace for 25 years, has a great future in store. The trade in six years has nearly doubled, and the financial position is good. There are 14,572 kilometres of railways and numerous important towns with a large demand, and also several good harbours on the sea coast.—*Handels Museum.*

Samples Museum in Brazil.—Official reports state that in the year 1902 a permanent Sample Museum will be established in Bella Novizonte, in the State of Minas, which is considered one of the most important in the Brazilian Union; it will contain agricultural and industrial products, and foreign countries are to be allowed to exhibit.—*Handels Museum.*

Soap Trade in Tripoli.—The large demand for soap in Tripoli is mostly supplied by imports from France, Italy, Tunis, Malta and Crete. French soap costs 36, and Italian only 28½ francs per 100 kilograms. Whilst formerly Marseilles was the principal source of supply, Italy now competes very successfully, owing to its lower scale of prices. The quality from Tunis is also too dear to compete advantageously with the Italian. The quantity of Maltese and Cretan soap is not very large.—*Handels Museum.*

Sugar Refinery in European Turkey.—In the neighbourhood of Adrianople a sugar refinery is being erected, the concession having been obtained by a high Turkish official (Reouf Pacha). All materials necessary for building and machinery are to be admitted duty free. Also it has obtained at the same time a concession for opening a deposit of coal which has been discovered in the vicinity of the refinery, and which will furnish the necessary fuel. The beet-root will be grown on the lands adjoining. The necessary machinery has already been ordered from European factories.—*Handels Museum.*

Trade in the Philippines.—A German trade society reported that although the pacification of the Philippine Islands has not yet been accomplished, still the news of its commercial prospects are so favourable that exporters cannot be too strongly recommended to pay attention to these Islands. During the period from July, 1900, to March, 1901, the imports have risen 52 and the exports 34 per cent. as compared with the previous year, and it cannot be denied that the American Administration

have had great success in improving the trade. It is of importance for exporters which system of duties the Americans will adopt, and whether American goods will have a preferential tariff—Spain had arranged formerly for such a preferential tariff—America has not adopted one at present, but whether it will ultimately do so remains to be seen. It is, however, important to note that the proposed scale of tariffs submitted by the commission in Manila and approved of by the War Department in Washington has retained the same scale of duties for American and foreign lands.

Trade Openings in Siberia.—The Canadian Pacific Railway recently sent a representative to make a complete tour over the Siberian Railway in order to investigate the possibilities which the country affords for the development of business, particularly in relation to manufactured goods. Mr. Whyte, who was chosen for the task, shows in his report that opportunities for trade are restricted considerably by the prohibitory import duties. Agricultural implements, however, find a ready sale. In fact, the Russian Government is itself introducing them in certain sections which, having been long settled, exhibit an adherence to primitive methods of agriculture. Axes and other cutting tools have a large market. Electrical apparatus also finds a sale in Siberia. Another feature of Mr. Whyte's report which deserves attention is the section devoted to the question of Siberia's fuel supply. Although a heavily wooded country extends along nearly all the route traversed by the Siberian Railway, that country contains large deposits of coal, which are already mined extensively both by the Russian Government and by private enterprise. The Siberian railroad, notwithstanding the abundance of wood for fuel, is mainly operated with coal, which is described as being of excellent quality. It is also worth noting that immigration from European Russia to Siberia is being carried on with considerable energy by the Russian Government. Its agents go about among the more thickly populated regions of Western Russia, make up parties of emigrants and dispatch them eastward along the railroad, where they are received by other Government agents and placed upon the lands granted to them. The Government allots a free grant of forty acres to each male emigrant, and sells supplies and implements on comparatively easy terms. In a Government publication, printed at St. Petersburg, it is stated that the Government expect to settle 5,000,000 people in Siberia during the next five years, and it is also claimed that by that time Siberia will export fully 30,000,000 bushels of wheat per annum.

Trade relations between Russia and America.—How evident it is that the present tariff war between Russia and the United States is only to be regarded as temporary, is shown by several opinions of the North American Press. They state that the future will show a more lasting basis than that with England. It is stated that the 640 kilometres of railway which, during the last ten years have been constructed annually in Siberia, have been made almost entirely with American materials. Rails, screws, waggons, etc., came from the United States, and principally from Pittsburg. The same applies to the East China line in Manchuria. At present passengers travel from Vladivostok to Chabarowsk, 763 kilometres, in Pullman cars from Chicago, and continued the journey by the Amoor and Schilka, by steamers, which are made at Pittsburg.

All along the Siberian railway numerous American posters are to be seen, advertisements of machine factories, etc. It is characteristic of the friendly feeling of Russia towards American exporters, that no advertisements besides Russian are allowed on the Siberian line. It is easily understood under these circumstances that this railway has carried in one lot 1,000,000 lb. of American machinery, and that from Pittsburg factories one million tons of railway materials were delivered in Russia during the year 1900. In the last few years two steamers have been despatched every week from Philadelphia and Baltimore loaded with American machinery for Russia.

In the meantime, however, North American journals complain that in Manchuria Russia is acting in an unfriendly manner, especially with regard to the imports of petroleum. The Russian Governor of Talienwan has forbidden the erection of warehouses for North American petroleum, with a view of rendering the importation of North American petroleum difficult in comparison with Russian.

United States.—COAL PRODUCTION IN PENNSYLVANIA.—The production of coal in Pennsylvania will, without doubt, be larger this year than ever, and is estimated as 10,000,000 tons higher than in 1900. The output in 1900 was 45,108,484 tons. In the first nine months of this year 40,309,786 tons have already been disposed of, against 34,202,710 in the same period of 1900. These figures represent the actual deliveries, and do not include the quantities used by the mines and coal companies. The demand is this year greater than ever; the production is quickly absorbed, and it is only in consequence of the want of transport that any stocks are left in the hands of coal companies.—*Handels Museum.*

United States.—EXPORT TRADE.—There are several "soft spots," says *Bradstreet's*, in the export trade of the United States which promise to still further accentuate the slight falling off already shown in the total volume of this branch of trade from a year ago. While the smaller takings of corn and cotton in themselves have been serious of late, the movement of these goods earlier in the year, and of wheat and wheat-flour all through the past summer and fall, were so large as to ensure a net gain in the export of agricultural products for the calendar year. In the exports of manufactured products, however, the same favourable report cannot be made, but when the reasons for this are examined into it is found that it is to the decline in the shipments of iron and steel and copper that the reduction in the exports of manufactures is due. For instance, the reduction in the aggregate exports of these two products is about \$46,500,000, about equally shared by iron and steel and copper, while the net reduction in exports of all manufactures is less than this, or only \$44,162,856. The export returns compiled by the Treasury Department Bureau of Statistics show that copper shipments for the ten months ending with October were 45 per cent. below those of 1900, and the value of iron and steel shipments is 21 per cent. less than last year. In the case of iron and steel the reduction is partly due to reduced prices per unit of quantity, in part to a reduced demand abroad, and in part to forced sales at low rates in certain foreign countries. In copper the reduction is not due to reduced prices, the average value per pound of the copper exports of the ten months of this year, being the same as that of the corresponding months of last year, viz., 16½ cents per pound. The reduction in copper, therefore, is in quantity, the exportation of ingots, bars and plates falling from 300,160,141 pounds in the ten months of 1900 to 162,728,397 pounds in the corresponding months of 1901. This falling off in the case of copper is due in part to a reduced demand in the European countries which were the chief foreign market for American copper, and in part to an increased production in other countries and reduction of prices by foreign producers. The only other important article showing a material reduction is mineral oil, which is about \$3,000,000 less than in the corresponding months of last year; but this decrease is solely due to reduced prices, the number of gallons exported in the ten months ending with October being 60,289,023 greater than for the corresponding months of the preceding year.

LABOUR MARKET. UNITED KINGDOM.

General Statistics.—The *Labour Gazette* reported that during November there was a decline in the engineering, ship-building and building trades. But, apart from this and the usual seasonal improvement in the printing trades, there were no marked changes in the state of employment compared with the previous month. On the whole, it is worse than during November, 1900, but considerably better than the average state of employment in November during the past ten years. In the 142 Trade Unions, with an aggregate membership of 545,832, making returns, 20,614 (or 3·8 per cent.) were reported as unemployed at the end of November, as compared with 3·7 per cent. in October, and with 3·2 per cent. in the 138 unions, with a membership of 539,175, from which returns were received for November, 1900. The average percentage of unemployed returned at the end of November, during the ten years 1891-1900, was 4·6. Twenty-five fresh

TRADE DISPUTES

began in November, 1901, involving 6,809 workpeople, of whom 4,924 were directly and 1,885 indirectly affected. The corresponding number of disputes in October was 26, involving 10,501 workpeople, and in November, 1900, 48, involving 18,099 workpeople. Of the 25 disputes in November, 1901, 8 occurred in the mining and quarrying industries, 9 in the metal, engineering, and shipbuilding trades, 3 in the textile trades, and 5 in other industries. Of the 25 new and old disputes, involving 6,500 workpeople, of which the definite result is reported, 7, involving 1,556 persons, were decided in favour of the workpeople; 11, involving 3,182 persons, in favour of the employers; and 7, involving 1,762 persons, were compromised. The changes in

RATES OF WAGES

reported during November affected 257,961 workpeople, and the net effect of all the changes was a decrease averaging 7½d. weekly per head. Of the total number, 10,500 received advances, and 247,461 sustained decreases. The changes of the previous month affected 17,684 workpeople, the net result being a slight rise, and during November, 1900, the number affected was 148,774, and the net weekly result was an advance of 4½d. per head. The principal decreases of the month were those sustained by 242,500 coal-miners in Durham and South Wales. Three changes affecting 109,032 workpeople were settled by Conciliation Boards, and three affecting 136,370 workpeople took effect under sliding scales. Changes affecting 1,133 workpeople only were preceded by disputes causing stoppage of work, and the remainder, affecting 11,458 workpeople, were arranged directly between employers and workpeople, or their representatives. During November the six Bureaux furnishing returns registered 1,597 fresh applications for work, as compared with 1,666 in November, 1900, a decrease of 69. Work was found by these bureaux for 813 persons, of whom 607 (454 males and 153 females), were engaged by private employers, 11 by Local Authorities, and 195 by the Salvation Army. The number engaged by private employers in November, 1900, was 682. The total number of workpeople reported as killed by

ACCIDENTS

during November was 424, or 57 more than in October, and also 57 more than in November, 1900.

COLONIES.

THE EMIGRANTS' INFORMATION OFFICE reports as follows:—**Canada.**—The report of the Canadian Department of Labour for November states: "The labour market generally continues in a healthy condition, full employment being the rule, and in many cases employers finding difficulty in securing sufficient labour. Partial exceptions exist in some districts where outdoor work—both of a public and quasi-public character, and building operations generally—shows a disposition to dulness, which, however, is quite usual at this season of the year. On the other hand, a good fall and winter trade has caused unusual activity in a number of trades which suffer from dulness during the summer." There is, however, at the present time no demand for more labour.

Australasia (New South Wales).—Disputes have arisen at the large Broken Hill silver mines on the working of the contract system. Under this system experienced men can make up to 15s. or even 17s. 6d. per shift of eight hours, but others complain that they can only make 2s. to 4s.; the average wages for a recent fortnight were 11s. 1d. per shift. There are also complaints of the inability to procure employment. In Sydney wages in many trades, especially the building trades, have risen, but wage-earners complain that the cost of living, owing to the proposed new tariff, has increased in greater proportion. Some of the branches of the boot trade, tailloresses, shearers, and glass bottle makers have been very unsettled, and are agitating for higher wages owing to the increased cost of living. The building trade is now less active, but all other trades continue to be fairly well employed, and there is some opening for general mechanics, plumbers, joiners, carpenters, and good labourers. **(New Zealand).**—There is no demand for more mechanics at Wellington. The building trades are busy in many places, but at Dunedin "they are very quiet," and at Christchurch "there are more unemployed carpenters just now than for years past." The engineering trade is only fairly busy, and at Dunedin some men are out of work. The boot and clothing trades are good generally, except at Dunedin, but there is no special demand for more hands. In several districts there is a demand for men able to milk, but otherwise the supply of unskilled labour has been quite sufficient. **(Queensland).**—There is a demand for farm labourers and ploughmen, but the supply of mechanics is for the most part sufficient. **(Victoria).**—There is stated to be a good demand at Melbourne for skilled shipwrights; the wages offered are 12s. a day and 2s. 3d. an hour overtime, but employment is not constant. In country districts farmers are suffering from the great difficulty of procuring competent farm hands and milkers, who prefer the higher minimum wage of 7s. a day and the shorter hours of work which the Government offers them in the towns. **(Western Australia).**—There is a demand for mechanics in one or two places only; there is no demand for miners anywhere; there is a good demand for agricultural labourers and for female servants.

South Africa.—In consequence of the establishment of Martial Law at all South African ports, it has been decided, with the concurrence of the Governments of the Cape Colony and Natal, that permits will be required by every person proceeding on and after the 1st January, 1902, to Cape Colony or Natal, to enable him (or her) to enter those colonies, and no person unprovided with such permit will be allowed by the authorities in South Africa to land in that country, except under special circumstances. Application must be made in person at the Permit Office, 39, Victoria-street, S.W., between the hours of 11 a.m. and 5 p.m., and should be made at least three weeks before the date of sailing. Permits will be issued with as little delay as possible, but the office cannot guarantee their issue within a period of less than three weeks from the date of application. Each applicant will be required to produce a certificate, signed by the Agent-General for the Cape Colony or Natal, a

member of Parliament, justice of peace, banker, parish priest or minister, or officer of H.M. Forces, to the effect that he is in possession of at least £100, or is in a position to maintain himself on arrival in South Africa, that the object of his journey is *bonâ fide*, and that he has not been deported or sent out of that country as indigent. Subjects of foreign Powers who may wish to proceed to South Africa from ports in the United Kingdom can obtain a permit on production of satisfactory evidence to the same effect from their respective embassies or legations in London. Passengers from ports not in the United Kingdom must supply themselves with permits from the Colonial Secretary or some officer appointed by the Colonial Government in the case of colonial ports, or from the British Consular Officer at a foreign port of embarkation, who will satisfy himself, as far as possible, that the applicants fulfil the above conditions. Members of a family proceeding to South Africa will be shown on the permit issued to its head, provided that a separate permit will be required for each son or daughter over 16 years of age. In view of the inconvenience and expense which a personal application for a permit to land in South Africa would entail in cases where applicants live at a considerable distance from London, persons living more than 50 miles from the metropolis may apply in writing to the South African Permit Office, 39, Victoria-street, when they will be informed of the conditions under which permits will be issued to them. Such applicants are, however, recommended to apply in person, if possible, especially in cases where the permit is required at an early date. It should be clearly understood that these permits are available only to enable passengers to land in South Africa, and are no guarantee that they will be allowed to proceed inland. Those who wish to do so must apply for permits at the port of disembarkation. The latter are warned that there are still thousands of persons waiting at the coast ports for an opportunity to return to their homes, who will probably have precedence over later arrivals.

EMIGRATION AND IMMIGRATION.

* * *The Imperial Institute acts in concert with the Emigrants' Information Office (which is under the direction of the Colonial Office), of 31, Broadway, Westminster, S.W.; and also with the British Women's Emigration Association, now temporarily carrying on its work in rooms at the Institute. The Handbooks and Quarterly Circulars issued by the Emigrants' Information Office may be obtained at the Commercial Intelligence Office. Special information and practical advice respecting Canada and Cape Colony will also be furnished by the Curators of these Sections.*

UNITED KINGDOM.

General Emigration.—The official parliamentary return of the numbers, nationalities and destinations of the passengers that left the United Kingdom for places out of Europe, during the month ended 30th November, 1901, shows that 20,675 emigrants sailed, as compared with 19,856 in November, 1900. Emigration to South Africa increased to 3,611 as against 2,889 in November, 1900; but to Canada and Australasia there were decreases of about 300 and 400 respectively. During eleven months of 1901, 290,325 emigrants sailed from our ports, or 3,168 more than in the first eleven months of the previous year.

Alien Immigration.—From the monthly return it appears that the total number of aliens that arrived from the Continent during November was 10,094, against 10,053 in 1900. Of this total, 5,483 represented the number of aliens not stated to be *en route* to America or other places out of the United Kingdom, and 4,611 represented the number *en route*. Of the total arrivals, 2,107 came from Germany, 1,120 from Holland, and 491 from Scandinavian ports.

British Women's Emigration Association.—The hon. secretary of the British Women's Emigration Association at the beginning of a new year reports the total number of applications received at the Emigration Office of this Association at the Imperial Institute in the twelve months, 3,851. From November 21 to December 21 there were 455 applicants, and the Association arranged for the passage of 34 persons, 31 of whom went to relations or to situations in South Africa.

The Home at Westminster, in which the emigrants have been able to lodge for the last six years, having been closed at the end of the year, it has become necessary for a Hostel to be established for the accommodation of the women who are obliged to sleep in London the night before they sail.

It is most necessary to have a safe and comfortable place where the parties can assemble, and where those waiting to embark can lodge economically. Each colony has its Receiving House, and such a Home in London would be available for emigrants to every colony. The Association possesses the furniture and fittings for 50 beds, and, until a house can be rented, is having to pay for the storage of these goods, as well as for rooms temporarily in another Home kindly offered for a time, in which our travellers can be received.

The very week the former Home was closed several young women from the country had to sleep the night in London before starting for Africa.

The Association makes a particular point of the proper protection of its travellers from the time they leave their homes until they are safely handed over to their friends or employers in the colonies, and that protection is as necessary while they are in London as anywhere else. Many of them are very grateful for this kind welcome and the rest, the night before leaving old England, and the Committee of the Association, feeling the great importance of this part of the work, has decided to take a house for this purpose as soon as possible.

The position and amount of room must depend upon the help given towards this special object, and the promise of future subscription towards its support. Respectable women can obtain temporary lodging in the Hostel at any time the rooms are not needed for emigrants, and their payments will help to make it answer. There is undoubtedly a great need for more temporary homes for women in London. The existing homes for working girls and other places of the kind are quickly occupied by young women in business, so that those out of employment or without a home of their own are often in difficulties where to find a decent shelter at a moderate cost. A well-managed house, with 25 to 50 beds, with two rates of payment, according to the sleeping arrangements, ought to be a success. Why should not someone, ready to spend money if only sure of its benefiting the colonies and the Empire, start this hostel in London for the British Women's Emigration Association?

A hostel for working men in Bethnal Green was opened in December, to receive 76 men at 6d. a night, with living and recreation rooms, and to found this an anonymous donor gave £2,250. The two-fifty, without the thousands, would found an Imperial Hostel for women emigrating, and it would be a centre for most useful work, in testing the fitness of applicants, and training those who required some probation or previous supervision. The medical inspections, the outfitting, the final instructions, the introductions, the farewell words, and the last letters home, would all find place under its roof.

Another development to which attention must be called is the monthly magazine, *The Imperial Colonist*, which is to be issued with the new year by the B. W. E. A. and the South African Expansion Committee, price 2d. a month, or 2s. 6d. a year, post free. It will be a means of communication between emigration workers, and their correspondents in all parts of the Empire, giving information about openings for the employment of women, and the arrangements by which they can avail themselves of them. Copies of *The Imperial Colonist* can be obtained at this office.

CUSTOMS TARIFFS.

UNITED KINGDOM.

Import Duties on Articles containing Sugar.—With regard to the rates of duty leviable on articles containing sugar, the Board of Trade have received a further amended Schedule of the fixed rates of duty on such articles, which has been issued by the Commissioners of Customs for the guidance of Customs officers. It appears from this document that the following additions require to be made to the Schedules already published:—

Confectionery, licorice—if declared by the importer	s. d.
not to contain more than 30 per cent. of added sugar or other sweetening matter—subject to occasional sampling and test	
Milk, condensed, slightly sweetened, whether whole, separated, or skimmed—if declared by the importer not to contain more than 18 per cent. of added sugar—subject to occasional sampling and test	1 3 0 9

COLONIES.

British North Borneo.—NEW CUSTOMS TARIFF.—The Board of Trade have received, through the Foreign Office, a copy of the *British North Borneo Official Gazette*, dated 14th October last, containing a copy of a Notification (No. 188), providing for the imposition of new rates of Customs duties on articles imported into, and exported from, the State of North Borneo, as from 15th October, 1901. The new tariff, in which the rates of duty vary considerably from those hitherto in force, may be seen by persons interested on application to the Commercial Intelligence Branch of the Board of Trade, 50, Parliament-street, S.W., any day between the hours of 10 a.m. and 5 p.m.

Mauritius.—PROHIBITION OF THE IMPORTATION OF CERTAIN ARTICLES FROM THE EAST COAST OF MADAGASCAR.—The Board of Trade have received a copy of a Proclamation (No. 56 of 1901), dated 17th October, 1901, revoking a previous Proclamation (No. 51 of 1901). The New Proclamation prohibits, in consequence of the existence of cattle plague, the importation from the East Coast of Madagascar, extending from Mahela to Fort Dauphin, of similar articles to those specified in the Proclamation published in the *Board of Trade Journal* for 26th September last, the chief of these articles being animals living or dead, also animals' produce and manures, as well as plants and agricultural produce generally.

FOREIGN COUNTRIES.

France.—CUSTOMS DECISIONS.—The Board of Trade have received copies of certain Circulars recently issued by the French Customs Department for the guidance of their officers, containing the following Decisions affecting the application of the French Customs Tariff:—

Allowance to sugars of French Colonies during the season 1901-1902, "for waste in manufacture."—Under the provisions of Article 2, Section 1, of the Law of the 13th July, 1886, sugars of French Colonies shipped to France are entitled to an allowance for waste in manufacture equivalent to the average excess-yield obtained by the home sugar industry in the preceding season. This average excess-yield having been equal to 28·97 per cent. in the season 1900-1901, French Colonial sugars imported into France during the season from the 1st September, 1901, to the 31st August, 1902, will receive an allowance for waste of 28·97 per cent.

AERATED WATER SYPHONS.—Vessels or syphons for aerated waters of glass or crystal, neither cut, engraved or ornamented, which have hitherto been classified as "bottles," are in future to be dutiable as "table-glass, plain and moulded," under No. 350 of the Tariff, at the rate of 4 francs per 100 kilograms gross (1s. 7½d. per cwt. gross).

France (Tunis).—IMPORTS OF TUNISIAN OLIVE OIL INTO FRANCE.—The *French Journal Officiel*, for the 30th November, contains the text of a Decree fixing at 20,000,000 kilograms the amount of olive oil of Tunisian production which may be imported into France free of duty during the 12 months ending the 30th November, 1902.

Germany.—CUSTOMS DECISIONS.—The Board of Trade have received translations of certain Orders, recently issued by the Hamburg Customs Authorities, affecting the classification for Tariff purposes of certain articles imported into the German Customs Union. The following is the substance of these Orders:—

Table-tops and oil trays for sewing-machine stands, even when imported separately from the machines, are to be treated as parts of sewing-machines (if recognisable as such), and are to pay duty under No. 15b (2) of the Tariff, according to the material of which made.

Bird-skins.—Skins of swans, herons, and divers (grebes), imported from the Argentine Republic under the designation of "raw skins of wild game," are to be admitted free of duty, under No. 12b of the tariff, as "birds-skins intended to be tanned," even although they may be dried and prepared to protect them against putrefaction and moths.

Cocobolo wood of the quality usually imported into Hamburg is to pay duty as "round wood in blocks (hard), not specially enumerated," under No. 13c (1) of the tariff, at the rate of 20 pfennigs per 100 kilograms. (= 2s. 0½d. per ton), or 1 mark 20 pfennigs per cubic metre (= 11d. per cubic yard).

Advertising cards of about the same size as post-cards, having a coloured picture and a trade mark on the front and advertising matter (with no space for written additions) on the back, are to pay duty as "printed paper cards, ready for use," under No. 27f (2) of the Tariff, at the rate of 12 marks per 100 kilograms. (6s. 1d. per cwt.)

CHANGES IN THE DRAFT OF PROPOSED TARIFF.—With reference to the proposed new German Customs Tariff (Part I.) the *Reichs Anzeiger* of the 14th November publishes a list of articles in respect of which certain alterations in the rates of duty originally proposed by the draft Tariff Bill have now been made. The following schedule shows proposed new rates:—

Tariff No.	Proposed Classification.	Rates of Duty.	
		Originally Proposed.	Now Proposed.
	The following duties have been <i>raised</i> —	Marks.	Marks.
452	Unbleached cotton tissues having 35 threads or less in a square of 5 mm.	100 kilogs. 50	100 kilogs. 60
489	Bleached linen handkerchiefs having more than 120 threads in a square of 2 cm.	" 140	" 145
	The following duties have been <i>reduced</i> —		
164	Linseed oil	" 6	" 4
164	Sesame oil, if rendered unfit for consumption	" 10	" 5
267	Phosphorus, red (amorphous)	" 20	" 10
	Phosphorus, yellow	" 15	" 5
381	Tanning extracts, not otherwise mentioned—		
	Liquid	" 8	" 2
	Solid	" 8	" 4
451	Dressed cotton tulle, not figured, if for embroidery, by special permission and under control	" 250	" 80
488	Unbleached linen handkerchiefs, having more than 120 threads in a square of 2 cm.	" 110	" 105
572	India-rubber threads, drawn or cut:		
	Not combined with textile materials	" 40	" 10
	Combined only with vegetable or animal textile materials loosely wound round or plaited thereon	" 40	" 20
	Wound round with silk or with yarn in which silk is contained	" 75	" 60
	Do. do. with other textile material	" 60	" 40
757	Microscopes	" 120	" 60
829	Rough chains for towing tugs	" 6	" 3
874	Copper printing-cylinders	" 30	" 18
875	Wire gauze of all kinds for industrial purposes	" 40	" 30
475	Cocoa-nut fibre drawn out into strands or spun of one or more threads, unbleached.	—	Free.
	<i>Note.</i> —Previously the exemption applied only to single unbleached yarn imported for industrial purposes and under permit.		
	The following alterations are further noted—		
275	<i>Acetic acid.</i> —The line of demarcation in weight between the two rates of duty is raised from 5 to 20 kilogs.		
438	<i>Unbleached single cotton yarn.</i> —The classification by numbers has been revised as follows:—		
	Up to No. 17 English	100 kilogs. 9	100 kilogs. 9
	Above No. 17 and up to No. 25 English	" 15	" 15
	Above No. 25 and up to No. 30 English	" 15	" 18
	Above No. 30 and up to No. 45 English	" 18	" 18
	Above No. 45 and up to No. 60 English	" 24	" 24
	Above No. 60 and up to No. 79 English	" 30	" 30
	Above No. 79 and up to No. 100 English	" 36	" 36
	Above No. 100 English	" 36	" 42
503	<i>Tracing cloth</i>	New Article	" 135
556	<i>Boots and shoes</i> of leather, with soles made of other material than wood. The schedule has been revised as follows:—		
	Weighing more than 1,200 grammes, per pair	100 kilogs. 85	" 85
	Weighing more than 1,100 and up to 1,200 grammes, per pair	" 85	" 120
	Weighing more than 600 and up to 1,000 grammes, per pair	" 120	" 120
	Weighing 600 grammes or less, per pair	" 120	" 180
786 to 788	<i>Iron or steel sheets</i> , of a thickness of 0.5 mm. or less, are now to pay the same rates of duty, under their respective Nos., as those between 0.5 and 1 mm. in thickness.		
925	<i>Vessels</i> of all kinds, imported to be broken up, are now to be free of duty, whether principally made of common metals or not.		

Russia.—RUMOURED PROJECTED REDUCTION OR REMISSION OF CUSTOMS DUTIES.—The British Commercial Agent in Russia reports that it is stated in the *Russkii Vedomosti* of Moscow of 3rd/16th November, 1901, that, according to rumours circulating in business circles at St. Petersburg, from next year the Customs duties on many articles of first necessity, as, for instance, iron, coal, machinery and implements imported from abroad, will be in part reduced and in part entirely rescinded.

Spain.—PAYMENT OF IMPORT DUTIES ON CERTAIN ARTICLES IN GOLD.—The Board of Trade have received a copy of a telegram from H.M. Ambassador at Madrid, stating that a Bill has been introduced into the Cortes by the Spanish Government, providing for the payment in gold of the import and export duties on certain articles. It is added that a Decree has been issued giving immediate application to the provisions contained in the Bill. The following are the articles on which, in accordance with the Bill and Decree, duties must now be paid in gold:—

Coal and coke; petroleum and mineral oils; oleonaphtha, vaseline, mineral lubricating oils, and mixtures of these products with animal or vegetable oils or fats; benzine, gasoline, and similar products; cod and stockfish; fish powder; wheat and wheat flour; cocoa and coffee from all countries, prepared or not; tea, yerba mate, cinnamon, and pepper, cloves, and other spices.

The duties on these articles are, however, to be subject to the following reductions dependent on the average rate of exchange, when above par:—

If 40 per cent. or more above par, a reduction of 30 per cent.
 " 30 to 40 per cent. " " " " 25 "
 " 20 " 30 " " " " " 20 "
 " 10 " 20 " " " " " 10 "

One of the provisions of the bill is to the following effect:—
 "By the average rate of exchange will be understood the profit on bill on sight from Madrid on Paris, according to the *Official Bulletin* of prices of the Madrid Bourse, in the month previous to that in which the payment of duties . . . takes place. On the last day of each month the Minister of Finance will fix the rate of exchange at which reductions in the payment of duties for the following month will be carried out, and this rate will be published in the *Madrid Gazette*.

According to a further despatch the Minister of Finance has fixed the rate of exchange for the month of December at 42.38 per cent., this having been the average rate during the month of November.

United States of America.—CUSTOMS DECISIONS.—The following is a list of some decisions affecting the application of the Customs Tariff and Customs Regulations of the United States which have recently been published by the Treasury Department at Washington, for the guidance of United States Customs Officers and others:—

Carbons for electric lighting.—Round sticks of carbon, one-half to five-eighths of an inch in diameter, and from 12½ to 20 inches in length, being ultimately intended for, and exclusively used in, electric lighting, are dutiable as carbons for electric lighting under para. 98 of the Tariff, at the rate of 90 cents per hundred.

Herbs in alcohol.—Herbs in alcohol, being articles manufactured by uniting or combining two elements or ingredients, are essentially compounds, and, as they contain alcohol, are dutiable at the rate of 60 cents. per lb. and 45 per cent. *ad val.*, under para. 2 of the Tariff. *Alcoholic extracts of herbs* are dutiable at the same rate.

Gloves.—Gloves made in chief value of cotton, and having a rubber braid or band at the wrist, are dutiable as cotton wearing apparel, under para. 314 of the Tariff, at the rate of 50 per cent. *ad val.*

Cotton cloths.—Fancifully-woven cotton cloths having open work stripes and other figures similar in some respects to net or netting, and bearing in certain proportions some resemblance to lace, are not dutiable as lace or lace goods (imitation or real), but are dutiable under the "countable para." of the Tariff (Nos. 304-310), with the additional duty of 2 per cent. per square yard provided in para. 313.

Prepared vegetables.—Vegetables cut open and washed and dried in the sun are dutiable as prepared vegetables, under para. 241 of the Tariff, at the rate of 40 per cent. *ad val.*

Carbonate of baryta, precipitated.—The exemption of carbonate of baryta from duty, under para. 489 of the Tariff, extends only to the natural mineral product known as "witherite." The artificial product, known as "carbonate of baryta, precipitated," is dutiable as a chemical salt or compound, under para. 3 of the Tariff, at the rate of 25 per cent. *ad val.*

Cotton tracing cloth.—Cotton tracing cloth, cut into sizes ready for use, is dutiable as "cotton cloth, filled or coated," under para. 311 of the Tariff, at the rate of 3 cents per square yard and 20 per cent. *ad val.*

Artificial wreaths.—Memorial wreaths of metal, or of metal and porcelain, painted to represent natural growths, are dutiable as artificial leaves and flowers, under para. 425 of the Tariff, at the rate of 50 per cent. *ad val.*

TRANSPORT AND FREIGHTS.

The Freight Market.—Outward rates have steadily declined, and current quotations are: Genoa 45. gd., Malta 3s. 9d., Port Said 45. gd., Las Palmas 6s., Buenos Ayres 10s. American markets are steady, but rates show very little improvement. **Australia** continues quiet. 23s. 9d. has been accepted for wool to U.K./Cont., and 25s. on d.w. to Cape ports. **Black Sea** market was active for prompt tonnage, but rates have again fallen away. **Eastern** markets have continued steady at 15s. Bombay, 22s. 6d. Calcutta, 21s. 3d. Rangoon. **Mediterranean** markets are steady at slightly improved rates. **River Plate** quiet at 16s. 6d. San Lorenzo limit.—WEDDEL, TURNER & Co., December 23, 1901.

UNITED KINGDOM.

The Clyde Shipbuilding Year.—The annual returns of the Clyde shipbuilding were issued on Saturday. They constitute a record for the river or any other shipbuilding centre. During the twelve months 296 vessels were launched, aggregating 530,000 tons, or nearly 40,000 tons more than in 1900, which was the previous highest year. Sixty thousand tons were represented by warships, five of the vessels being first-class cruisers. The sailing-vessels showed a marked decrease. The outlook for the ensuing year is not so encouraging.

Shipbuilding on the Wear.—The returns for 1901 of the thirteen shipbuilding firms on the Wear aggregate 270,329 tons Board of Trade measurement. This establishes a record for Sunderland, and an increase of 7,547 tons compared with last year's output. Messrs. Joseph L. Thompson and Sons, Limited, head the list with 39,137 tons.

Shipbuilding on the Tyne.—The shipbuilding returns for the river Tyne show that the total production of the yards has been 310,000 tons during the year just closing, only 5,919 tons short of the previous twelvemonth. The list is headed by Palmer's Shipbuilding and Iron Company, whose production has been 51,291 tons.

Service of Steamers between Harwich and Bruges.—As soon as the ship canal to Bruges is completed the Great Eastern Railway Company intends to start a service of steamers between Harwich and Bruges, the voyage to take not longer than four hours.

COLONIES.

Canadian Railways.—A NEW TRANSCONTINENTAL LINE.—In celebration of the driving of the last spike on the new line of the Canadian Northern Railway between Lake Superior and Winnipeg, Messrs. Mackenzie and Mann, the promoters of the system, were entertained at a banquet on the 30th ult. by the citizens of Port Arthur, Ontario. The road is now open for traffic for 1,500 miles, passing through Manitoba, and will be continued westwards to the Pacific Coast to form a new transcontinental line north of the Canadian Pacific, and traversing an exceedingly fertile prairie country.

Hong Kong.—SHIPPING.—Sir H. A. Blake, in his report upon Hong Kong, states that the tonnage of British ships entering the harbour of the colony during 1900 was 4,588,610 tons, and clearing 4,566,588 tons. The German shipping showed next with 959,173 tons entering and 958,571 clearing. Then follow in order vessels under the Japanese, French, Chinese, American, Norwegian, and Austrian flags. The tonnage of Chinese junks entering and clearing was 1,604,632 and 1,620,224 respectively; and of Chinese ships, other than junks, 136,765 and 138,507 respectively. The total of foreign ocean-going tonnage which entered and cleared was 2,425,086 and 2,425,311 respectively. The comparative shipping return for the years 1899 and 1900 shows, in the case of vessels under the British flag, an increase of 103 ships, measuring 430,182 tons; but there was a decrease in the river trade under the British flag of 111 vessels of 58,317 tons. This may be ascribed to the fact that certain British steamers engaged in the West River trade were sold. Many of the Chinese merchant steamers were transferred to the British flag, but the Scottish Oriental Steamship Company was transferred to the German flag, thus increasing German tonnage by 62,057 tons in arrivals, and 68,806 tons in departures.

Uganda Railway.—The laying of the rails of the Uganda railway has been completed to the Victoria Nyanza, the rail-head reaching the shore of the lake on December 19 last.

The West India Mail Service.—The directors of the Royal Mail Steam Packet Company have been in negotiation for a considerable period with the Government with a view to an enhanced speed in the West India mail service. At present the mails are landed at Plymouth once a fortnight, and are embarked at Southampton, the contract rate of speed being 13 knots. The steamship company has now offered a 14½-knot service from Plymouth to Barbados, which, by embarking the mails at the western port instead of Southampton, would give two days between the time of arrival at Plymouth and the next departure thence for replying to correspondence, the subsidy being £97,500 per annum for a five years' or £85,000 for a ten years' contract. The correspondence between the Government and the steamship company has been forwarded to the authorities of our West Indian possessions, who have been asked by Mr. Chamberlain to express their views on the matter.

INDIA.

Bombay and Delagoa Bay.—A regular steamship connection between Bombay and Delagoa Bay has been effected by the British India Steam Navigation Company. This Company's old line of boats running from Aden to Zanzibar now includes a monthly departure from Bombay via Zanzibar and Mombassa to Aden, and *vice-versa*, and connects at Zanzibar with the same Company's Zanzibar-Delagoa Bay line.

Karachi.—GRAVING DOCK.—A new graving dock for taking small craft was opened on November 1 last by the Karachi Port Trust, built to the designs and under the supervision of Mr. Edward Jackson, M.Inst.C.E., the port engineer, the work being carried out departmentally. It is entirely of Portland cement concrete, the entrance, hollow quoins, sill, dock floor, side walls, and coping all being formed of this material, in the proportion of seven shingle and sand to one Portland cement; the hollow quoins for the keel-posts of the gate being faced with concrete two to one for an average thickness of 15 inches. No stone masonry of any kind has been used in the work. The gates are of oak, copper-sheathed. The length over the blocks is 240 feet, at coping level 261 feet, width at bottom over blocks 43 feet, and at coping level 89 feet 6 inches; width of entrance 50 feet, depth on sill at high water ordinary spring tides 12 feet 9 inches. The cost of the temporary dam, dock gates, etc., exclusive of pumps, which were available, was £8,300.

FOREIGN COUNTRIES.

Germany.—THE NEW KÖNIGSBERG SEA CHANNEL.—With the recent inauguration of the channel across the Frische Haff to Königsberg, a work has been accomplished which promises to prove an immense advantage to that city. Hitherto large ocean vessels, for which there has been an abundant depth of water in the river Pregel, on which the city stands, have had to lighten at Pillau, because there was not depth enough of water in the Haff to permit of their getting into the river fully laden. This was not only inconvenient and costly, but caused much waste of time. Now, however, a remedy has been found. The principal advantage of the new fairway is, perhaps, the fact that it can more easily be kept free of ice than has hitherto been possible in the case of the two old channels—the Königsberger Rinne and the Pillauer Rinne. The cost has amounted to about fifteen million marks. The length of the channel from Pillau to the mouth of the Pregel is a little over twenty miles, and to this must be added about eight-and-a-quarter miles for the regularisation of the Pregel stream. The width of the channel between the dams is 87½ yards, and the breadth on the floor 32½ yards. In constructing the dams a double row of piles were driven in about 3 feet 6 inches apart, and the intervening space filled up with stones. Five sidings or passing places are provided in the channel, thus increasing the width of the bed at these spots by about 16 yards, and allowing the continuous progress of large steamers in both directions. The traffic will be controlled from Pillau, whence the keepers of the signal stations will receive their instructions by telephone as to the hoisting of the signals on the masts—balls by day and lights by night. The dues payable are: 1 pfennig per cubic metre per register ton net by vessels measuring up to 800 cubic metres, and another pfennig for every additional 200 cubic metres; the dues on cargoes are divided into three categories, namely, 15, 7½, and 5 pfennige per ton.—*Fairplay*.

Japan.—MERCANTILE MARINE.—Some statistics from Tokio just published show that the Japanese mercantile marine consisted in January, 1899, of 679 steamers, measuring 470,534 register tons, and 1,485 sailing vessels, measuring 165,710 register tons; in January, 1900, of 752 steamers (498,375 tons) and 2,783 sailers (270,161 tons); and on the 16th September, 1901, of 942 steamers (557,166 tons) and 3,416 sailers (315,767 tons).—After negotiating with the Russian Government, the Japanese Government has decided to establish in the coming spring a regular line of steamers between Tsuruga (Wakasa Bay, Nippon) and Vladivostok.

OFFICIAL AND COMMERCIAL CONTRACTS.

UNITED KINGDOM.

Blackburn.—The Corporation invite TENDERS, until the 18th inst., for the SUPPLY of MACHINE TOOLS required at their Tramway Depot, Intack. Particulars may be obtained from Alfred S. Giles, engineer and general manager, 9, Railway-road, Blackburn.

Kirkcaldy.—The Corporation invite TENDERS, until the 8th inst., for the SUPPLY, DELIVERY, and ERECTION of steam, exhaust, feed and drain pipes, feed pumps, feed heater, feed tank, tools, etc. Particulars (£3. 3s.) may be obtained from W. L. Macindoe, town-clerk, Kirkcaldy.

London.—The London County Council invite TENDERS, until the 28th inst., for the SUPPLY of TRACK RAILS, SLOTTED RAILS, CONDUCTOR TEE RAILS, with fish-plates, etc. Particulars (£2) may be obtained at County-hall, Spring-gardens, London, S.W.—(Barking).—TENDERS are invited, until the 24th inst., for the SUPPLY and ERECTION of additional GENERATING PLANT for the electricity works. Particulars (£1. 1s.) may be obtained from the engineer, Electricity Works, East-street, Barking.

Middlesbrough.—TENDERS are invited, until the 21st inst., for the SUPPLY and ERECTION of the following PLANT for the extension of the electricity works:—(a.) One 300 kw. high-speed STEAM DYNAMO and Accessories. (b.) SWITCH-BOARD PANELS. (c.) Condensing Apparatus and Pipe-work. (d.) Feed-Pump and Economiser. Particulars (£5. 5s.) may be obtained from Mr. Robert Hammond, 64, Victoria-street, Westminster.

Newcastle-on-Tyne.—The Tyne Improvement Commissioners invite TENDERS, until the 18th inst., for the CONSTRUCTION and DELIVERY at the Tyne of Four Single-screw STEEL HOPPER BARGES. Particulars (£3. 3s.) may be obtained from R. Urwin, secretary of the Tyne Improvement Commission, Berwick-street, Newcastle-on-Tyne.

Southampton.—The Director-General, Ordnance Survey, invites TENDERS, until the 13th inst., for the SUPPLY and ERECTION of FOUR HAND and POWER LITHOGRAPHIC PRINTING PRESSES, with four cast iron beds. Particulars may be obtained from the officer in charge of stores, Ordnance Survey Office, Southampton.

COLONIES.

Transvaal (Johannesburg).—TENDERS are invited, until the 31st inst., for the SUPPLY and DELIVERY of a complete CARRIAGE WATER GAS PLANT of a capacity of about 200,000 cubic feet daily. Particulars may be obtained from the Crown Agents for the Colonies, Downing-street, London, or from the town-clerk, Johannesburg.

INDIA.

Calcutta.—TENDERS are invited, until February 5, for the SUPPLY and DELIVERY, c.i.f. Calcutta, of 50 6-in. and 12 4-in. WASTE WATER METERS. Particulars were published in the *Engineer* of December 20 last.

South Indian Railway.—TENDERS are invited, until the 14th inst., for the SUPPLY of ROLLING STOCK, BRIDGE-WORK, Stores and Stationery. Particulars may be obtained at the office of Sir George B. Bruce, 3, Victoria-street, Westminster.

FOREIGN COUNTRIES.

Belgium.—TENDERS are invited, until the 28th inst., for the work of improving the Ghent canal at Terneuzen, between the bridge at Wondelgem and the Canardière bridge below Langerbrugge. The upset price of the work is £145,462. 5s. 2d., and a deposit of £7,200 is required. Particulars (2 frs. 60 cts.), may be obtained from the chief engineer, M. de Heem, Directeur des Ponts et Chaussées, rue d'Abraham No. 11, Gand; or from the engineer-in-charge, M. Grenier, Quai des Tonneliers No. 6, Gand (Ghent).—TENDERS are invited, until the 14th inst., by the National Company of Local Railways, 14 Rue de la Science, Brussels, for the CONSTRUCTION of the section of the LINE from Ath to Oudeghien on the railway from Ath to Fiobecq. The upset price is £6,688. 6s. 1d., and a deposit of £680 is required. Particulars (1 fr.) may be obtained at the Company's offices.

Norway.—TENDERS are invited by the Norwegian State Railways, until the 20th inst., for the SUPPLY of WATER-PIPES as follows:—200 metres 5-inch cast-iron socket-pipes, turned, bored, and dipped; 100 metres 4-inch cast-iron socket-pipes, turned, bored, and dipped; 1,700 metres 3-inch cast-iron socket-pipes, turned, bored, and dipped, besides irregular fittings, stop valves, taps, etc. Also for plumbers' work at four stations on the Ofoten Railway, to be done next summer. Particulars may be had from the head engineer's Office at Narvik. Besides Customs duties, the Norwegian Government give a preference of 15 per cent. to native tenders.—TENDERS are invited by the Norwegian State Railways, until the 8th inst., for the SUPPLY of RAILWAY POINTS. Particulars may be examined at the Commercial Department of the Foreign Office.

Spain.—TENDERS are invited by the Committee of the Port Works at Barcelona, until the 9th inst., for the SUPPLY of VEHICLES for the new commercial depot, and until March 10th, for the SUPPLY of a powerful STEAM TUG. Conditions and specifications can be seen at the office of the secretary to the Port Committee at Barcelona.—TENDERS are invited, until the 7th February, at the office of the Port Works at Huelva for the SUPPLY of METALLIC MATERIALS necessary for the execution of the works of the northern portion of the shipping wharves in the said port. Particulars are on view in the Secretariat of the Committee. A provisional deposit of 15,000 pesetas, or about £443, is required to qualify any tender. The contract may be estimated to be worth about £8,850.

COMMERCIAL LAW INTELLIGENCE.

Collision.—Loss of Mails.—Judgment was given in the Court of Appeal in the important appeal of the *Winkfield*—the SEAFIELD SHIPPING CO., LTD., v. UNION STEAMSHIP CO., LTD. (limitation of liability). The Master of the Rolls, in giving judgment, said this appeal was from an order of Sir F. Jeune dismissing a motion made on behalf of H.M. Postmaster-General in the case of the ss. *Winkfield*. The question arose out of a collision which occurred on April 5, 1900, between the ss. *Mexican* and the ss. *Winkfield*, which resulted in the loss of the former and a portion of her mails. The owners of the *Winkfield*, under a decree limiting their liability, paid a lump sum into court, and the claim in question was one by the Postmaster-General on behalf of himself and the Postmaster-Generals of Cape Colony and Natal to recover out of that sum the value of letters and parcels that had been registered and belonged to them in their capacity as bailees, and from first to last the case was argued on that footing. It was said in defence to the claim

that a bailee could not support an action unless he himself was liable to make good to the bailor the loss which had been occasioned by the wrongful act of the third party, and that as the Postmaster-General could not be sued, so neither could he sue in respect of these letters and parcels. But that was a wrong decision. In an action against a stranger for loss of goods occasioned by his negligence the bailee in possession could recover the value of the goods. The Postmaster-General was entitled to claim in the participation of the fund. The Lords Justices concurred, and the appeal was accordingly allowed, with costs.

Factory and Workshops Act.—In the King's Bench Division, before Mr. Justice Ridley and Mr. Justice Bigham, the case of the CONSOLIDATED PROPERTIES COMPANY v. CHILVERS was an appeal against a conviction obtained at the instance of the London County Council, for non-compliance with a notice to provide a fire-proof staircase. The London County Council required the Consolidated Properties Company, who carry on business at 112, Queen Victoria Street, to provide a new staircase from top to bottom under s. 7 of the Factory Act, 1891. The Consolidated Properties Company, Limited, however, could not comply with this order, because the ground floor and basement were let to other tenants who refused to allow the work to be done. The magistrate sitting at the Mansion House convicted the Consolidated Properties Company, and said that the question whether the order could be complied with ought to have been settled by arbitration under the section. The company appealed and afterwards went to arbitration, and a report was made by the arbitrators with which they were perfectly willing to comply. It was objected on the part of the London County Council that the conviction took place in March, 1900, and that it was not until February, 1901, that the company went to arbitration. The Divisional Court quashed the conviction, on the ground that it was for not complying with a notice with which it was impossible to comply.

Freight and Shortage.—In the King's Bench Division, the *WILHELMINA STEAMSHIP COMPANY, LIMITED*, sued Messrs. ARTHUR H. BRANDT & COMPANY for £99. 13s. 10d. balance of freight. Defendants admitted the claim, but counter-claimed for that amount of shortage. According to the bills of lading, 52,597 bags of sugar were shipped on the *Wilhelmina* (s.) at Vizagapatam for London, but on arrival in London there were, defendants stated, 199 bags short. Plaintiffs contended that they had delivered all the cargo that had been shipped. His Lordship (Mr. Justice Bigham) held that the bill of lading quantity had been received by the vessel so as to make the vessel responsible for the goods, and that the number of bags actually delivered out of the ship was the number which appeared on the return made by the Dock Company. He gave judgment for defendants.

The "Tied House" System.—A case involving an important question of law with regard to the tied house system has been disposed of in the House of Lords. The matter arose on an appeal in the action of NOAKES and COMPANY v. RICE from an order of the Court of Appeal affirming a judgment of Mr. Justice Cozens-Hardy. The appellants were a brewery company at Bermondsey, and were mortgagees of the King's Arms, Camberwell. The respondent, Mr. George Veasey Rice, acquired the public-house from them. By an indenture between the parties, the house was conveyed to the respondent for the residue of their term, the appellants advancing to him a certain sum for the purchase, which was secured by mortgage. There was a covenant that he should not sell malt liquors except such as were purchased from the appellant company. Six months afterwards the respondent gave the company notice to pay off all the moneys secured by the deed, provided the company were willing to release him from this covenant. They refused to acquiesce, and the respondent sought a declaration that on payment of all the moneys due he was entitled to have a reconveyance, and a release from the covenant in question and all the other covenants. Mr. Justice Cozens-Hardy, in giving judgment, said the mortgage was a security for the moneys covenanted to be paid, and that on payment the appellant company were bound to surrender and reconvey, and such surrender and reconveyance was inconsistent with the retention of an interest in the premises. He accordingly gave judgment for the respondent, and the Court of Appeal affirmed his decision. The company now appealed, contending that the covenant, which made the King's Arms a "tied house," as it is called, was valid in law, and precluded the respondent from the relief which he sought, and further that in equity he could not be relieved from a bargain into which he deliberately entered, and on the faith of which he obtained an advance from them which enabled him to purchase the premises. On the other hand the respondent said that to hold the covenant in force, after the mortgage was paid off, would be in direct contradiction to the terms of the proviso for redemption, and if regarded apart from the equity of redemption the covenant was unconscionable and oppressive, and therefore void. The Lord Chancellor, in giving judgment, said he was unable to come to any other conclusion than that the equity of redemption here was fettered by a condition which the policy of the law did not allow. He therefore moved that the appeal be dismissed with costs. The other noble and learned lords concurred. The appeal was accordingly dismissed.

BRITISH CONSULAR REPORTS.

France (Bordeaux).—COMPETITION BETWEEN AMERICAN AND BRITISH COAL AT BORDEAUX.—In a despatch to the Foreign Office, dated the 25th November, H.M. Consul at Bordeaux reports that the amount of coal imported into Bordeaux in 1900 was 850,000 tons, of which 840,000 came from the United Kingdom. Part of the balance of 10,000 tons came from the United States, but only as ballast in French steamers working regularly between Bordeaux and New York, which were not able to find other cargo to bring home.

This year, however, in addition to this ballast coal, of which 1,500 tons were brought in the last steamer, two cargoes have been brought over, one of 3,600 tons in a British steamer, and one of 5,000 tons in a Spanish steamer, while another 5,000 tons have been bought and are awaiting shipment.

The Consul also writes as follows:—"I am informed by experts, that there is very little to choose for steam purposes between the best American and the best Welsh coal, and that the demand for the one or the other will, in the future, when American coal has become better known, be a question of cost production and freights."

The cost of the coal, according to the Consul, is much lower in the United States than in the United Kingdom, but it appears to be only the excessively low freights at present prevailing on the other side of the Atlantic which allow of its being imported into Bordeaux. To obtain these low freights the coal appears to have to wait its chance.

The two cargoes mentioned above were shipped at 8s. 6d. and 9s. 6d. a ton as against 4s. from Cardiff.

The Consul further writes: "For the men to restrict output in order to keep up prices so that they may draw higher wages on the sliding scale, is to play directly into the hands of the

American coal trade and to allow it to get a grip of the market, which it will be careful not to lose.

"I believe, for gas-making purposes, American coals cannot at present, at any rate, enter the market against English gas coal."

Switzerland (Zurich).—THE SILK INDUSTRY.—In a report by the British Commercial Agent at Zurich on the silk industry of Switzerland, it is stated that the recent publication of the proposed revision of the German Customs Tariff, which has given a strong impetus to the discussion of tariff questions, has induced the *Zürcher Post*, one of the principal commercial journals published in Switzerland, to arrange for a series of articles to be written for that journal by experts in the most important branches of Swiss exports, as to the probable effect the proposed new German Tariff would have upon the Swiss export trade. The first of this series of articles, dealing with the silk industry, has recently appeared.

The value of silk exports from Switzerland in the year 1900 amounted to £8,959,000, or more than one-fourth of Switzerland's total exports in that year (£33,443,000). The writer of the article states: "If the Swiss silk exports were to be divided up amongst those countries with which we are compelled to negotiate commercial treaties, since the period of protective duties has visited the European continent, our position would indeed be a critical one. We ought, therefore, to consider ourselves fortunate that the chief portion of our products is sent to the only country in the whole of Europe—England—which has up to now held fast to free trade."

The importance of our silk trade with England is shown by the following figures, which give the percentage for the last five years of England's share in our total silk export industry:—

1896	42½ per cent.
1897	44 "
1898	42 "
1899	42½ "
1900	44½ "

"If England were to impose taxes on articles of luxury, such as silk, on fiscal grounds, and to cover the costs of the war, and if, for example, she were to fix a duty on silk on the same scale as the German duty, it would practically mean the closing of nearly all our silk factories. The English market is already a keen field of competition for our silk exports; the manufacturers of the whole world are competing against each other for the English trade, and it is especially the rapidly-increasing Japanese silk industry which makes the struggle so keen. The result of a duty being imposed on silk in England would inevitably be, that factories would be started in that country by home and foreign manufacturers, which would be able to compete successfully with their continental rivals. At the present moment the condition of things does not necessitate such a step."

"There is every ground for confidence that, as soon as the war in South Africa is at an end, and provided that the British Chancellor of the Exchequer does not lay his heavy hand upon silk imports, the deficit of silk imports in the year 1900 will soon be made up. Our exporters are building great hopes upon this period, as well as upon the change in the commercial policy of America, which has frequently been prophesied of late. An industry, 95 per cent. of the production of which is exported, and of which nearly one-half of the total exports go to one single market (Great Britain), a market which is year by year becoming more flooded, and which is so sensitive to every change in the fashions, cannot but look with anxiety into the future."

The writer of the article then deals with the silk exports to Germany, and gives the percentages for the last five years, namely:—

1896	8.6 per cent.
1897	8.2 "
1898	8.2 "
1899	7.2 "
1900	6.1 "

"The duty hitherto imposed on Swiss silk goods is 600 marks or 15 per cent. of the average value, which is sufficiently high to protect the German silk industry. In the new tariff proposals the duty (on piece silk goods) has been increased to 900 marks, or 22½ per cent. of the average value, but it is not thought that this increased rate will be adopted, as the Crefeld factories have during the last few years been fully occupied, and there is therefore no fear of the Swiss exports injuring the German industry."

"There are altogether 23 Swiss silk factories established in foreign countries, the mechanical weaving looms being distributed as follows: Germany, 3,652; France, 1,445; Italy, 1,408; America, 2,058. This 'emigration' may be regarded as a corrective against over-production in our own country; it is not without value for our country if Swiss firms go abroad in order to wage a battle with foreign competition, particularly as most of the Swiss establishments in other countries are only branches of the home factories, and not independent establishments. If it were necessary it would be possible to use these branches for the purpose of giving employment to Swiss workmen in the event of a crisis taking place at any time at home."

FOREIGN CONSULAR REPORTS.

Furs of the Upper Yukon.—Dawson is the central market for a vast fur-bearing country, stretching from the Mackenzie Basin to the coast range, and from the Porcupine to the Hootalinqua. In this area, perhaps, 1,000 men are engaged in hunting and trapping, exclusive of the Indians; and from Dawson fully 40,000 peltries are annually exported to the great fur markets of London and New York. The industry yields a revenue every year of nearly \$350,000. In the local markets London quotations govern. These are fixed twice a year—in March and August—by a board of principal dealers in that city, and prices are gauged according to that scale in all parts of the world except Russia. The present rates, compared with prices a year ago, show an increase on bear, beaver, otter and mink, and a decrease on silver-grey fox, marten, wolf and wolverine. On most other peltries quotations are the same. A wide difference is often noted between the maximum and the minimum figures; this is due to variations in the shade and quality of the fur, and to the time of the year in which the animal was caught. Local dealers say the pelts in the vicinity of Dawson City are of better quality and obtain higher prices than those taken along the Lower Yukon and on the Alaskan coast. The hair is softer and more glossy in appearance. In varieties, marten are the most numerous and black fox the scarcest. The latter is the most valuable of all, a good pelt readily bringing \$300; and muskrat is the least costly, being worth only 4 cents. The favourite rivers among the trappers are the Pelly, White, Stewart, and Porcupine, while game hunters prefer the Klondike and Forty Mile, because of their accessibility to a ready market. The Big and Little Salmon, Hootalinqua, Chandelar, and Selwyn rivers, are also frequented by many trappers, while a goodly band is scattered along the Yukon itself. The Peel and other streams flowing into the Mackenzie Basin are also considered choice trapping grounds. The annual production

of the different varieties of pelts, their market value, and special facts distinguishing their distribution, are given as follows:—

Beaver.—Black, silver tip, brown, grizzly, and cinnamon; found all over the country from March to November; number shipped, 3,000; price, \$10 to \$25. It takes an exceptionally fine skin to bring more than the maximum figure quoted.

Beaver.—On all streams, but chiefly numerous on White, Pelly and Stewart rivers; number shipped, 2,500; price, \$3.50 to \$7.

Mink.—On all streams; number shipped, 1,500; price, \$1.50 to \$3.

Marlen.—On all streams; number shipped, 25,000 to 30,000; price, \$3.50 to \$12.

Otter.—On Pelly and along the Yukon, most of the pelts coming from below Dawson; number shipped, 200; price, \$4 to \$8.

Foxes.—Red: number shipped, 2,000; price, \$1.25 to \$2.50. Cross: number shipped, 650; price, \$3 to \$10. Silver gray: number shipped, 25 to 40; price, \$100 to \$200. Black: number shipped, 5 to 7; price, \$200 to \$300.

Lynx.—Mostly from along the Dalton trail; number shipped, 2,000; price, \$1 to \$2.50.

Wolves.—Black and gray, mainly near the mountains; number shipped, 2,000; price, \$1 to \$2.50.—*United States Consular Report.*

New Fuel for Swedish Railways.—Sweden imports yearly large quantities of coal and coke, and this trade is increasing steadily, in pace with the industrial activity and the building of new railroads. Several millions of dollars are annually paid out to foreign countries for fuel. This has caused the authorities to consider whether Sweden could be made more independent in this respect. It has been suggested that the State railroads could get their motive power partly from waterfalls, and experiments will probably be made in this line. The managers of the State railroads have been instructed to make trials of peat charcoal and peat briquettes as fuel for locomotives. The intention is to construct a special locomotive to be used in these experiments, and if they are successful other engines will undoubtedly be built, because peat is abundant in this country. The navy and the State railroads have also tried to use Swedish coal, but without success; the efforts will be continued, however. A Gothenburg newspaper reports as follows:—

In the new briquette factory at Elmhult, belonging to the State, experiment will be made in the production of a cheap and practical fuel for Swedish railroads. In locomotive furnaces, Swedish coal cannot be used alone, because it contains too much scrap and incombustible substances, which are not consumed, but form offal and ashes. It must, therefore, be mixed with English coal, but this is becoming more and more expensive. The possibility of using Swedish coal alone is therefore ideal, and the above-mentioned factory has been built to be employed in the attempts to make or refine Swedish coal into a good fuel. The factory will operate according to a German patented method, and has been put up under the supervision of a German. It will be started this fall, and the work will continue night and day. It is calculated that the output will be 36 briquettes per minute—that is, 51,840 per 24 hours, or 15 cartloads of 10,000 kilograms per car. Experiments will first be made with 40 cartloads of Swedish coal of the lowest grade.—*United States Consular Report.*

Paper Trade in Japan.—According to an American consular report, the paper trade in Japan is already becoming more developed, and a good quantity is now being manufactured for export. Nevertheless, Japan imported in 1900 more than 20,000 tons of paper. The greater part of this came from Germany, which sent all descriptions with the exception of cigarette and printing paper. France sent most of the former and England the latter—some paper for newspaper printing came from America.

Plumbing and Sanitary Appliances at Nice.—Modern improvements are being introduced into buildings in this consular district, and the United States Consul is of the opinion that the use of sanitary appliances will assume large proportions in the next few years, and that manufacturers should seek to enter this field. The system of supplying hot water throughout houses has not yet been adopted here, but detached water-heaters are largely used. Considerable quantities of these goods have been imported from England; up to the present the sales of German firms have consisted principally of brass cocks and faucets and of plain zinc baths. Nickel-plated goods pay a very high duty, and non-detachable parts subject the entire article to the same duty. Manufacturers should, therefore, nickel only such parts as may be detached and weighed separately. The high prices charged up to the present for the most elementary sanitary appliances have been the cause of the limited consumption. Manufacturers of standard lines or of specialties should find a reliable agent to handle their goods and ship them direct, thus avoiding freight charges, middleman's profit, and commissions. Where possible, a certain credit should be given. In one case, a German firm gave a plumber one year's credit on a bill of brass cocks and toilet faucets. He now purchases all this kind of goods in Germany.

Soap and Substitutes for Soap in Syria.—The United States Consul points out that while toilet and shaving soaps are imported from abroad, the Syrian soap-manufacturing industry is by no means unimportant. This refers particularly to the Nablous, Haifa, and Tripoli soap factories. "Mount Carmel soap," manufactured by an American firm at Haifa, is in demand in the United States. Olive oil enters largely into the production of Syrian soap. Importers will find in Syria an article which is extensively used for washing woollen stuffs, as it does not shrink them, to wit, the soapwort (*Saponaria officinalis*) root, which takes the place of our wool soap, does the work equally well, and is incomparably cheaper. In the opinion of the United States Consul, it would pay to import this root. Pressed into bales, it would form a product which could be conveniently transported. Letters on this subject may be addressed to H. Sabbag and Fils, Beirut, Syria. The root is also successfully used in washing fresh and fast-coloured cotton fabrics, as it prevents their fading. The Arabic name for this useful root is "shursh-halawy." The Arabs of the interior use the desert shrubs "ushran," of the family of *Salsolaceae*, by burning them, and extracting the soda from the ashes. Indeed, the ash is almost pure soda. A solution of it is powerfully detergent. They also use lye, procured by lixiviating the ashes of wood and charcoal, for washing clothes. Sesame oil is commonly employed by Arabs for "cleaning" face and body, also for prickly heat, and other diseases of the skin.

Trading Firms in Japan.—The Austrian Consul at Yokohama reports that the number of European and American firms established in Japan is decreasing. At Yokohama in 1899 there were 303, while in 1900 there were only 248. The number of Japanese merchants in China and Korea is increasing. As soon as things in China return to their normal state it is expected that a large contingent of Japanese merchants will proceed thither and carry on a keen competition with foreigners. In Korea they have already made all competition impossible. The report points out that Japan is thus becoming more and more, particularly in the Asiatic Continent, an important commercial factor which ought not to be under-estimated.

CHAMBERS OF COMMERCE REPORTS.

UNITED KINGDOM.

Leeds.—The Council of this Chamber had under consideration at a meeting on the 26th November, certain suggestions for reforming the Parliamentary machine, so as to render it a more workable and efficient instrument. The present system, under which private bill legislation not only entails a great waste of time, but a large amount of cost to local authorities, came in for hearty condemnation all round. The President (Mr. G. R. Portway) moved this resolution:—That the Council take steps to obtain the views of the commercial community as represented by Chambers of Commerce throughout the country on the desirability of a re-arrangement of the conduct of business in Parliament, and the method of taking divisions so as to avoid the present waste of time. The extension of the system of the devolution of business to committees, especially the consideration of the estimates. Bills which have passed their second reading in one session being taken up in the same Parliament at the stage which they had reached in the preceding one; and enquiries into private bills being conducted locally before a Commissioner appointed by Parliament, and not before Committees of the Houses of Parliament, in a manner similar to that prescribed by the Act of 1899 with regard to Scotch Bills.

Mr. Portway pointed out that recent events had shown the present Administration to be desirous of reforming the conduct of public business in Parliament. At present they had a machine which could not do its work, chiefly because it was not adapted for what it had to do. One authority declared that during last session only one bill of any importance initiated by a private member was carried through. By passing some such resolution as he proposed the Chamber would strengthen the hands of Parliament in effecting a reform that was much needed by the whole commercial community. Too much time was now occupied in taking divisions, and too little spent in investigating the national expenditure. At present our expenditure was growing by leaps and bounds—not merely on account of the war, but the normal expenditure also. In a year or two he feared that we should be feeling, and feeling very heavily, the weight of taxation. Surely the country was entitled to ask that there should be some really efficient control exercised over the estimates of the country. The President dwelt on the costliness of private bills promoted in Parliament. It was estimated, he said, that £500,000 was spent every year on legislation of this kind, and of this sum the Leeds Corporation must spend a considerable amount each year.

Mr. John Ward said that, frequently, a local authority had to go before a Committee of Parliament who had not the least knowledge of the local circumstances of the case under consideration. He had known bills promoted by the Leeds Corporation that had involved at least a fortnight's time in London. The fees of counsel and witnesses were, in such circumstances, very great—especially if an unfortunate authority were called upon to pay the expenses of the opposition. It was expenditure that no local authority should be put to. Mr. H. Barron said that as to the proposal to appoint a Commissioner to enquire into local bills, he was not at all sure that that would be a wise plan. Chairmen of Committees of Parliament were, in any event, men of affairs and free from local prejudices. Alderman Wurtzburg agreed that the expense of getting private bills through Parliament was enormous. In a case that came under his own notice, concerning a light railway, the Commissioners who held the enquiry granted an order, but the Board of Trade, whom they represented, afterwards said it must come before Parliament. In such a case as that the expense to the promoters was doubly great. The resolution was unanimously passed.

On the motion of Mr. Zossenheim, the Council agreed to a resolution asking local Members of Parliament to support the compulsory adoption of the metric system in this country "within a reasonable time." The difficulties in the way of the change contemplated were pointed out, and a diversity of opinion expressed as to the number of years that should be allowed before the system became compulsory.

Manchester.—A meeting of the Board of Directors was held on the 11th ult., Mr. John Thompson, president, occupying the chair. A letter from the Birmingham Chamber of Commerce on the subject of the prejudicial effect upon British industry of the action of shipping conferences in maintaining differential freight rates to the disadvantage of exporters of British manufactures, was remitted to the Shipping Committee for consideration and report. The attention of the Chamber has recently been called to the policy of the French Colonial Office in granting trading concessions involving monopolies which, it is alleged, are not in conformity with the International Act of Berlin respecting Africa. On the 13th November a joint deputation, representing the Liverpool, London and Manchester Chambers, had an interview with Lord Lansdowne at the Foreign Office with special reference to the concessions in the French Congo. The proceedings were not made public, but the representative of the Manchester Chamber reported that satisfactory assurances had been given to the deputation that the action of the French authorities was under the careful consideration of the Foreign Office. The minutes of the India, China and Colonial Committee contained a reference to the recently completed official telegraphic vocabulary, which it was intended to make obligatory for the selection of words for use in international code telegrams. This matter, which has been the subject of much consideration and correspondence by the Chamber since the inception, several years ago, of the project of a compulsory vocabulary, is receiving the attention of other commercial bodies. Other matters under consideration were London-Paris afternoon train service; sub-basements in warehouses; Parliamentary procedure; contracts for exports to Delhi; and patent law reform.

Newport (Mon.).—At a recent meeting of this Chamber an address was delivered by Mr. Joseph Lawrence, M.P. for Monmouth District (Sheriff of London), upon the question of competition in steel-making. In the course of his address Mr. Lawrence called attention to statements made to him by Mr. Schwab, President of the United States Steel Trust, in reference to the cheap manufacturing cost in the United States. He referred also to the cheap transport of material in that country, instancing the cost of carriage from Pittsburg to New York, 450 miles, which was less than that from Liverpool to Birmingham, one-fourth of the distance. Mr. Lawrence said there was no doubt we would in time feel the effects of the American steel competition, and that we must be prepared for it. If the steel trade was to continue in this country, it must resort to cheaper ores and to carrying cheaply, and to do this that portion of the freight must be eliminated which consisted of carrying dirt as well as ore. It should be crushed at the mines and the ore extracted.

Walsall.—At a meeting of the Council of this Chamber, on the 25th November, Mr. F. Rathbone presided, and mentioned that details of the Australian Commonwealth tariff were being printed for the information of local traders. The particulars were very complicated, but, roughly speaking, the duties appeared to be about 20 to 25 per cent. against all comers, and it was hardly necessary to say that there was no preferential treatment of Great Britain. The members of the Chamber had no doubt seen a report of the speech by Mr. Hay before the New York

Chamber of Commerce, and he (the President) took it that many of the United States duties against this country would be reduced in some way. The President also reported that it had been found necessary to abandon the idea of having a Walsall section at the Wolverhampton exhibition, owing to so few local manufacturers showing any inclination to be exhibitors. The promoters of the exhibition had, however, been thanked for their offer. He (the President) thought he might say the Chamber did all it could in the matter, considering how late in the day it was approached. The President mentioned that the five scholarships offered by the Chamber in connection with the commercial course at the Science and Art Institute had all been awarded, and Mr. H. D. Clark stated that, although the number of students going through the full commercial course was not very large, it had to be borne in mind that it necessitated attendance at seven classes each week, and individual classes in office routine and French were more numerous attended this year than at any previous period. A report was read from Messrs. H. Bompas Smith and J. H. F. Grayson with regard to the commercial course at Queen Mary's School. This gave details of the work which had been done, and the opinion was expressed that the institution of the classes appeared to solve the problem of how to equip the business men of the future for their vocations. Mr. W. H. Brookes said the only addition he could suggest to the subjects taught was that the importance of being industrious should not be lost sight of. Mr. J. Scott expressed pleasure at the work being done, and said he believed unless parents would allow their boys to remain at school long enough to learn French, German, and Spanish, the town was bound to suffer, as many firms had been injured by having to place their interests abroad in the hands of foreigners.

The President said he understood the reference by Sir Walter Peace, Agent-General for Natal, to the question of the standardisation of metals had aroused a good deal of interest, and was of considerable importance to firms at Wednesbury, which was in the area of the Chamber. Mr. A. W. Hutton said the subject was one of great importance to iron and steel manufacturers, and one with regard to which matters were getting worse and worse, owing to the difficulty of meeting the specifications which were put before them. Engineers got hold of a lot of specifications, and picked out the worst possible test in every case, and put them all in one specification, so that not only did the mechanical test not agree with the chemical test, but they were incompatible with one another. As everyone knew, steel with a very high tensile strain would not elongate very much, but they expected the same elongation out of high tensile steel as out of low tensile steel, and the consequence must be that the tests could only be passed by means of some trickery. It must clearly be against the interests of the people who ordered the materials, and the manufacturer before whom these extreme tests were placed, that this state of things should exist. It was a question of great importance to many districts, and ought to be taken up in earnest. A letter was also read from Mr. W. E. Blyth on the same subject, in which he suggested that the Chamber should communicate with the Wolverhampton, Sheffield, Middlesbrough, and Birmingham Chambers, and see if some general course of action could be agreed upon with a view to the formulation of a scheme which could be brought before the Government. The President intimated that he proposed to convene a special meeting with regard to this subject, and he had promises of support from firms in the district who were interested. A letter was read from the National Telephone Company urging that it was unreasonable that they should be called upon to supply all subscribers with a complete directory when the greater portion of it was never used, and the opinion was expressed that their explanation removed most of the cause of complaint. Mr. J. A. Leckie proposed a resolution urging the establishment of a municipal telephone exchange for the town. The service they had was excessively charged for, and this no doubt accounted for the fact that there were only 202 subscribers in Walsall. This was one of the matters in which continental towns were far ahead of us, and, as an instance of this, could be cited Copenhagen, which with 312,000 inhabitants had 15,000 telephone subscribers. At the same ratio Walsall would have had 4,500 subscribers. The opinion having been expressed that the present time was inopportune for the Chamber to commit itself to this proposal, it was agreed that the resolution should merely express approval of the enquiries which were being made by the Town Council into the subject, and in this shape it was unanimously passed. It was announced that a set of harness for the model horse at the Science and Art Institute had been gratuitously manufactured by several local firms, to whom Mr. Clark expressed the indebtedness of the Technical Instruction Committee. He proposed a vote of thanks to all concerned, and Mr. Scott, in seconding this, said the quality of the harness was testimony to the ability of local firms to turn out goods of the highest class.

GENERAL INTELLIGENCE OF THE PAST MONTH.

December, 1901.

UNITED KINGDOM.

DEC. 1st: The Queen's Birthday was celebrated.
2nd: The King, accompanied by the Prince and Princess of Wales, left Sandringham for Marlborough House, where His Majesty received the new German Ambassador and the Ministers of Ecuador and Hayti. Death of the Earl of Sefton. Colonel Sir H. Smith resigned the Commissionership of the City Police. Mr. R. Kettle was appointed a Metropolitan Police Magistrate.

3rd: The Prince of Wales accepted the Presidentship of St. Bartholomew's Hospital. Lord Shaftesbury was appointed Chamberlain of the Prince of Wales's Household, and the Hon. A. N. Hood Private Secretary. The Queen Victoria Memorial Fund amounted to £182,000. Sir A. R. Scoble and Sir J. W. Bonser were appointed Members of the Judicial Committee of the Privy Council.

4th: The National Liberal Federation held a meeting at Derby. The annual meeting of the British South Africa Company was held. Death of Sir W. MacCormac.

5th: The King returned from Frogmore to London. The Prince and Princess of Wales visited the City, and were entertained by the Corporation at the Guildhall in celebration of their return from their colonial tour. Dr. Weldon, Bishop of Calcutta, was appointed Canon of Westminster.

6th: The Postmaster-General received a deputation from the Loudon County Council protesting against the terms of the new Post Office telephone scheme. Death of Sir Charles Legard.

7th: The Duke of Cambridge distributed prizes for shooting to the Middlesex Imperial Yeomanry. A petition was made against the appointment of Canon Gore to the Bishopric of Worcester.

8th: Death of Lady Grimthorpe.

9th: The King and the Prince of Wales visited the Smithfield Club Cattle Show. The Transvaal War Fund at the Mansion House amounted to over £1,130,000.

10th: The King signed a proclamation fixing June 26 next as the date of the Coronation. Mr. Cripps, K.C., M.P., was appointed Attorney-General to the Prince of Wales.

11th: The British Delegates to the Sugar Bounties Conference at Brussels were appointed. The Board of Trade decided that the continuous current system should be adopted by the Underground Railways.

12th: The Royal Agricultural Society held its half-yearly meeting, Prince Christian presiding. The Agricultural Education Committee held a meeting.

13th: Death of Admiral Sir George Eliot. The Poor Law Conference was concluded. Mr. R. A. Germaine was appointed Recorder of Lichfield.

14th: Major-General Baden Powell left Southampton for South Africa. A committee was appointed by the President of the Board of Trade, to report on the Light Railways Bill.

15th: Death of Sir James Laing.

16th: The King and Queen arrived at Marlborough House from Sandringham. Lord Rosebery addressed a great Liberal meeting at Chesterfield. The Rev. A. W. Upcott was elected Head Master of Christ's Hospital. Death of Sir Francis de Winton. Death of the Ven. David Lewis, Archdeacon of Caermarthen.

17th: The King held an investiture at St. James's Palace. The Crown Prince of Siam visited Manchester.

18th: At Castlebar, Mr. Conor O'Kelly, M.P., and four other members of the United Irish League were sentenced to imprisonment. Pro-Boer riots occurred at Birmingham. Death of Lady Ellis.

19th: Mr. Asquith addressed a Liberal meeting at Bilston. Lord Morpeth, Mr. M. Macdonald, and Mr. J. Sinclair, (Progressives) resigned their seats in the London County Council. Small-pox cases increased in London.

20th: Dr. W. Somerville was appointed Assistant Secretary of the Board of Agriculture. The Head Masters' Conference was opened at Birmingham.

21st: Lord Rosebery was presented with the freedom of the borough of Swansea. Mr. J. P. Hayden, M.P., and six others were convicted of unlawful assembly at Ballinlough, and sentenced to imprisonment.

23rd: Death of the Earl of Carrick. Death of Sir Henry Gilbert, in his 85th year. Death of Mr. Onslow Ford, R.A., sculptor. A serious accident occurred on the Liverpool (Overhead) Electric Railway.

24th: The Marquess Ito arrived in London. At Ballymote, Mr. Jasper Tully, M.P., Mr. J. O'Donnell, M.P., and three others, were sentenced to imprisonment for unlawful assembly.

26th: Major-General Sir E. T. H. Hutton left Folkestone for Australia. Dr. A. Smith Woodward, F.R.S., was appointed Keeper of the Department of Geology in the Natural History Museum. It was announced that the King would open Parliament in person on January 16. Smallpox and fever cases increased in number in London. Death of Sir Noel Paton.

27th: The King received the Marquis Ito at Marlborough House.

28th: A Royal Commission was appointed to enquire into the resources of the coalfields of the United Kingdom.

30th: The King and Queen, accompanied by Princess Victoria and the Duke and Duchess of Fife, left Marlborough House for Sandringham. It was stated that the Deanery of Chichester was offered to Archdeacon Mount. Death of Rear-Admiral F. W. Hallowes.

COLONIES.

Australia.—4th: The Pacific Islanders Bill was passed by the Senate.—6th: The Alien Immigration Restriction Bill was passed by the Senate.—13th: The Federal Parliament adjourned till January 14.—23rd: The offer of another Australian contingent of 1,000 men for South Africa was accepted. **New South Wales.**—6th: The Industrial Arbitration Bill was passed by the Legislative Council.—17th: The new Land Bill was passed by both houses. **Victoria.**—11th: Sir G. S. Clarke, the new Governor, arrived in Melbourne.—23rd: The Parliament was prorogued. **South Australia.**—5th: The Legislative Council amended the Constitution Bill, increasing the members of the Council from 18 to 21, and reducing members' salaries to £150, and also those of the ministers.—17th: The Parliament passed the Constitution Bill. **Queensland.**—14th: The Government requested that the Pacific Islanders' Bill should be held back, so that an appeal against it might be made. **Western Australia.**—7th: Mr. Morgan, the new Premier, Mr. Quinlan, Commissioner of Public Works, and Mr. Nanson, Minister of Lands, were re-elected, and Mr. Moss, Colonial Secretary, and Mr. Moorhead, Attorney-General, were defeated.—20th: The Ministry resigned.—23rd: A new Ministry was formed, with Mr. Leake as Premier and Attorney-General. Lord Hopetoun arrived in Perth.

New Zealand.—13th: Mr. Seddon offered to send 1,000 more men for service in South Africa.

British West Africa.—3rd: The expedition against the Aros tribes made a successful advance into the country and occupied posts.—29th: News was received that the Aro town of Arochuku had been captured.

Canada.—1st: The death of Baron Aylmer of Richmond was announced. The new contingent of 600 mounted rifles left Montreal for South Africa.

Cape Colony.—1st: It was announced that no person would be allowed to land in British South Africa without a permit. The Cape-Cairo telegraph line was constructed as far as Ujiji.—5th: The Government requisitioned 1,000 horses in the Cape Peninsula.—7th: The main portion of the Colony was cleared of Boers.—17th: General French reported the capture of Commandant Kritzinger and the dispersal of his commando.—30th: General Baden-Powell arrived at Cape Town.

Malta.—4th: The Council passed a resolution asking for the removal of the Chief Secretary.

Natal.—6th: Mr. Geo. Payne was appointed Treasurer.

Newfoundland.—15th: It was reported that Mr. Mareoni, at St. John's, had received messages by wireless telegraphy across the Atlantic from a station in Cornwall.—31st: The *modus vivendi* with respect to lobster-fishing on the French shore expired.

Orange River Colony.—6th: It was reported that De Wet had concentrated the Boers near Heilbron.—20th: Colonel Damant's corps was attacked by 800 Boers under Botha at Tafel-Kop.—24th: The Boers under De Wet rushed Colonel Pirman's camp at Tweefontein.

Transvaal.—2nd: Lord Kitchener reported further captures of the Boers.—4th: General Bruce Hamilton captured a Boer commando in the Ermelo district.—10th: General Hamilton's force captured the Bethel commando at Trichardsfontein.—11th: The financial position of the Transvaal was reported to be hopeful. Proclamations were issued with regard to natives' rights.—13th: General Hamilton's column captured Piet Viljoen's laager at Witkranz.—18th: An agreement was signed for the re-opening of the Delagoa line and the importation of natives for the mines, from Portuguese territory.—19th: The Johannesburg Stock Exchange was re-opened.—23rd: Many captures of Boers were reported. The corps of Burgher Scouts, raised from the refugee Boers did good service.

INDIA.

1st: Lord Curzon arrived at Lashio from Mandalay, and held a durbar of the Shan chiefs. The number of persons in receipt of famine relief was 92,000.—4th: It was reported that seventeen native princes and nobles had joined the Imperial Cadet Corps formed at Meerut.—5th: A column under General Denning was sent to suppress the Mahsuds.—9th: The Viceroy had a hearty reception on his arrival at Rangoon.—18th: Lord Curzon returned to Calcutta, having completed his tour.—23rd: The number of persons in receipt of famine relief rose to 107,000.—26th: The Indian National Congress was opened at Calcutta.—27th: The Indian Congress passed resolutions on the questions of famine, the separation of judicial and executive functions, and police reform.

FOREIGN COUNTRIES.

Abyssinia.—16th: It was reported that the Emperor Menelik refused to grant any mining concessions to the Abyssinian Exploring Expedition.—17th: The 201st kilometre of the Jibuti-Harar railway was opened.

Argentine Republic.—23rd: The Chamber passed a resolution prohibiting the export of horses and mules.—24th: It was decided not to press demands on Chili, and to submit the issue to the Boundary Commission.

Austria-Hungary.—7th: A public appeal was made to put an end to duelling.

Belgium.—5th: The new Army Bill was adopted in the Chamber.—16th: The Sugar Bounties Conference held its opening session in Brussels, and elected the Belgian Premier as President.—20th: The Government Sugar Bill was passed by the Chamber.—24th: The Senate passed the second reading of the Anti-Gambling Bill.

Bulgaria.—24th: The Sobranje rejected the proposed loan. The Premier announced the suspension of the sittings.—27th: The Karaveloff Cabinet resigned.

Chile.—13th: 30,000 men were called out to protect the mountain passes against the Argentine Republic.—14th: A basis of settlement of the frontier dispute was proposed by Chile.—22nd: Another contingent of the National Guard was called out.—26th: The dispute with the Argentine Republic was settled.

China.—2nd: The Empress continued to favour reform and re-organisation. Yuan Shih-Kai, the Viceroy of Chih-li, decided to make Tung-chau the capital of the province instead of Tien-tsin. The Boxers continued to give trouble in the North-east.—4th: Sir J. Mackay arrived at Shanghai. Yuan Shih-Kai proposed to re-organise the naval and military forces.—5th: Kuei-chun, Viceroy of Sze-chuan, was appointed Viceroy of Canton in succession to Tao-mu, resigned.—12th: The title of junior guardian of the Heir-Apparent was conferred on Sir Robert Hart and Shing Ta-jen.—16th: It was announced that the Court had left Kai-fong-fu for Peking.—22nd: The Court arrived at Tsze-chau.

Colombia.—4th: It was announced that General Diaz had agreed to surrender.

Corea.—29th: The Government permitted the Japanese to lay a cable and a wireless telegraph service between Fusan and Chemulpho.

Crete.—15th: It was decided to appoint Prince George as High Commissioner for a further term of three years.

Denmark.—27th: A petition was presented against the sale of the Danish West Indies to the United States.

Egypt.—3rd: The Khedive arrived at Khartoum and was enthusiastically welcomed by the native population.—4th: The Khedive held a levée at Khartoum.—5th: The Khedive reviewed 4,000 troops.—9th: The Khedive inspected the great dam at Assouan.

France.—6th: The Senate passed the China Loan Bill. The Chamber approved a Customs Tariff Convention between France and the Congo State.—10th: The annual banquet of the British Chamber of Commerce in Paris was held. The International Automobile Exhibition was opened in Paris.—17th: The Chamber decided to discuss the ecclesiastical estimates.—25th: Death of M. Henri Fouquier.

Germany.—2nd: Count von Büllov introduced the new Customs Tariff Bill in the Reichstag.—5th: The Marquis Ito arrived in Berlin.—15th: The Grand Duke Michael Alexandrovitch arrived in Berlin on a visit to the German Emperor.—18th: The Statue of Johann Georg, 7th Elector of Brandenburg, was unveiled in Berlin.—23rd: The marriage of the Grand Duke and Grand Duchess of Hesse was dissolved by a verdict of the Supreme Court of the Duchy.

Holland.—7th: Mr. Kruger took up his residence in Utrecht.—27th: The Second Chamber adjourned till February, after voting the estimates.

Italy.—16th: The Pope condemned the new Divorce Bill.

Japan.—10th: The Emperor opened the Diet in person.—28th: A meeting of National Unionists protested against Russia's continued occupation of Manchuria.

Peru.—9th: Congress passed a law definitely adopting a gold standard.

Russia.—4th: Marquis Ito left St. Petersburg.—27th: A draft of a new commercial treaty with Italy was signed.

Spain.—3rd: A motion of censure against the Minister of Finance was rejected in the Chamber. The infant son of the Prince and Princess of Asturias was baptized.

Sweden.—5th: The King accepted the resignation of Dr. Annerstedt, Minister of Justice, and appointed Dr. Hammarström as his successor.—10th: The Nobel peace prize was awarded.

Switzerland.—12th: The Federal Assembly elected M. Zemp (Catholic Conservative), of Lucerne, President of the Confederation for 1902, and M. Deucher (Radical) of Thurgau, Vice-President of the Federal Council.—25th: The Zionist Congress was opened at Basel.

Turkey.—3rd: An Iradé was issued approving the arrangement between the Porte and the Ottoman Bank for an advance of T.£600,000.—24th: General Edib Pasha was appointed Vali of Monaster.—27th: Further mutinies of unpaid Albanians were reported.

United States.—2nd: Congress was opened; M. Henderson was elected Speaker of the House of Representatives.—3rd: President Roosevelt sent his message to Congress.—4th: The report of the Isthmian Canal Commission favoured the Nicaragua route, and estimated the cost at \$189,864,000.—5th: The text of the Hay-Pauncefote Treaty was published.—10th: It was reported that the Nicaraguan Government had agreed to lease to the United States a strip of territory 6 miles wide, including the route of the proposed canal.—10th: Mr. Carnegie offered to present £2,000,000 for educational purposes. Mr. Wilbur Wakeman, appraiser of the port of New York, was called on to resign.—11th: Messrs. Redmond, McHugh and O'Donnell left New York in the *Oceanic*.—14th: The report of the majority of the Court of Enquiry condemned Admiral Schley for his conduct at the battle of Santiago.—16th: The Senate ratified the Hay-Pauncefote Canal Treaty.

Venezuela.—21st: A serious rising against President Castro, headed by General Mendoza, was reported.—28th: It was reported that the rising was spreading. Difficulties occurred with Germany on account of unpaid claims.

FORTHCOMING EVENTS.

UNITED KINGDOM.

London.—On the 7th inst, there will be an entertainment at Eaton Hall in connection with Princess Christian's Fund for CAPE TOWN CATHEDRAL.—On the 16th, at the Society of Arts, Mr. Francis H. Skrine will read a paper on "Bengal: the Land and its People."—On the 27th, Mr. J. Stanley Gardener will lecture at the Royal Geographical Society on "The Maldives Islands."—The annual meeting of the Association of Technical Institutions will be held on the 31st, Sir W. Hart Dyke, M.P., in the chair, when Lord Avebury will give an address.

COLONIES.

West Indies.—The fourth annual WEST INDIAN AGRICULTURAL CONFERENCE will be held at Barbados on Saturday and Monday the 4th and 6th inst. The members of this conference will consist of the principal officers, appointed by their respective Governments, connected with the chemical, botanical, and educational departments in the West Indies. There will also be present representatives of the chief agricultural societies in the West Indies and the technical officers on the staff of the Imperial Department of Agriculture. The object of the conference, as laid down by the Secretary of State, is the reading of papers and discussion on the scientific and economic aspects of the sugar-cane and other industries.

FOREIGN COUNTRIES.

Austria.—VIENNA FISHERY EXHIBITION.—Vienna is next year to be the scene of an international fishery exhibition, and the committee in charge of the arrangements invite the co-operation of all societies, clubs, and institutions connected with fishing, all commercial fishing enterprises, fishermen, anglers, fish fanciers, and fish breeders, as well as the representatives of all trades at home and abroad related to the fishing industry. Intending exhibitors should apply to the British Consul-General in Vienna for further information. (**Tetschen, Bohemia.**)—An exhibition of general manufactures will be held at Tetschen, Bohemia, from 15th July to 15th September, 1902. Tetschen is a growing town of 10,000 inhabitants, situated on the River Elbe. Its importance is relatively much greater than its size, as it lies close to the frontier of Germany, and Customs examinations and train changes occur there. Several public buildings will be used for the exhibition, and space therein should be engaged by 1st February, to insure against disappointment. Exhibits cannot be placed, however, before 1st June, and must all be on hand by 10th July. It is expected that reduced freight rates for exhibits will be secured on the railways and the River Elbe, and that the tariff laws will be suspended for their benefit. Further information can be obtained by addressing Der Vollzugs-Ausschuss der Ausstellung, Tetschen, Bohemia.

Belgium (Antwerp).—CARTOGRAPHIC EXHIBITION.—Under the auspices of the Royal Geographical Society of Antwerp, founded 25 years ago by General Wouvermans, an exhibition of cartography, ethnography, etc., is to be held in commemoration of the society's silver jubilee. Every endeavour (says the *Indépendance Belge*) will be made to bring together a collection illustrative of cartographic methods from the earliest times to the present. (**Lille.**)—AN INTERNATIONAL EXHIBITION, the first of its kind, will be held at Lille from May to September next. Installed on the Champ de Mars, its buildings and gardens will cover a surface of 150,000 square metres; a gallery of 3,000 metres will be reserved for machinery. The exhibition will comprise the following classes:—I. Education. II. Works of art. III. Liberal arts. IV. General machinery. V. Electricity. VI. Civil engineering, means of transport, cycles, motor-cars, sports. VII. Agriculture. VIII. Horticulture. IX. Forestry, hunting and shooting, fishing. X. Alimentary products. XI. Mines and metallurgy. XII. Furnishing, decoration and accessories. XIII. Yarns, tissue, clothing. XIV. Various industries. XV. Chemical industry. XVI. Social economy, hygienics. XVII. Colonisation, materials and products for exportation. XVIII. Special applications of alcohol (alcohol dénaturé) to motive power, heating, and lighting. Experiments in this direction are of the highest interest for the commerce and manufactures of the district. All entries and applications for information should be addressed to the Offices of the Administration of the Exhibition, 35, Rue Nationale, Lille.

Russia (St. Petersburg).—The opening of the INTERNATIONAL FISHERIES EXHIBITION will take place on the 15th/28th inst. In addition to those from Russia, applications and notices of exhibits have been received from France, Germany, Great Britain, Italy, Norway, Roumania, Japan, Egypt, and Siam. The Government has granted to the Imperial Russian Fisheries Society, which is organising this exhibition, a subsidy of 35,000 roubles.

Denmark.—AN EXHIBITION OF AUTOMOBILES is to be held in Copenhagen from April 11 to April 27, 1902.

NAVAL AND MILITARY INTELLIGENCE.

NAVAL.

Mr. Phillip Watts, of the firm of Armstrong, Whitworth & Co., has been appointed Director of Naval Construction, in the place of Sir W. H. White, resigned.

Captain Charles A. Adair, commanding the battleship *Royal Sovereign*, will succeed Rear-Admiral Charles Campbell in command of Sheerness Gunnery School.

The authorities of Chatham Dockyard have been informed by the Admiralty that the date of launching the *Prince of Wales*, battleship, has been fixed for March 25 next.

Orders have been given directing the turret ship *Cyclops* to be disarmed at Sheerness Dockyard, and placed on the non-effective list.

Captain Egerton, of the Torpedo Department at the Admiralty, has been selected for the command of the *Vernon*, torpedo ship, at Portsmouth.

The good service pension of £150 a year, vacant by the retirement of Captain A. Schömburg, has been awarded to Commodore Robert L. Groome.

Rear-Admiral T. S. Jackson, by the retirement of Admiral Adeane under the age limit, becomes first on the list of his rank, and will have very shortly to relinquish his position as Superintendent of Devonport Dockyard on promotion to Vice-Admiral.

The Admiralty have purchased a small Nielauss boiler which has been on view at the Glasgow Exhibition, and have ordered it to be fitted on a small steamboat for experimental purposes.

The *Grafton* will be commissioned at Chatham on January 14 by Captain Marx, with a complement of 571 officers and men, to relieve the *Warspite*, flagship, on the Pacific Station.

The *Espigle*, sloop, will be commissioned at Sheerness on January 21, with a complement of 113 officers and men, for the relief of the *Pigmy*, gunboat, Lieutenant and Commander A. H. Oldham, on the China Station.

Colonel H. St. G. Schömburg, C.B., has relinquished the command of the Chatham Division of Royal Marine Light Infantry, on promotion to the rank of Major-General, and was succeeded at Chatham by Colonel Roger Pine Coffin, the second commandant of the Plymouth Division.

The Admiralty have awarded the Good Service Pension of £300 a year, vacant in consequence of the death of Admiral Sir William H. Stewart, G.C.B., to Admiral the Hon. Sir Edmund R. Fremantle, G.C.B., C.M.G., Rear-Admiral of the United Kingdom.

The cruiser *Pearl* was commissioned at Devonport on the 17th ult. by Captain E. P. Ashe for service on the Cape of Good Hope and West Coast of Africa Station. The *Pearl* will relieve the cruiser *Philomel*, which was commissioned on December 1, 1898, at Devonport, to which port she is to return and pay off.

The *Fearless*, cruiser, Commander J. I. Graham, left Sheerness on the 15th ult. for China to relieve the *Brisk*, cruiser, Commander E. H. Martin. The following are particulars of her commissioned steam trial:—Steam pressure in boilers, 117 lb.; vacuum—starboard, 25.9 in., port, 26.4 in.; revolutions—starboard, 132, port, 133.1; i.h.p.—starboard, 1,080, port, 1,107, total, 2,187; speed, 14.5 knots.

The Devonport dockyard authorities have received instructions to prepare to build a battleship larger than any now existing. Its displacement will be 16,500 tons, and its length 425 feet. The previous largest battleship designed for the British Navy, one of the new *Queen* class, has a displacement of 15,000 tons, and length of 400 feet. The new ship will be known as of the *King Edward the Seventh* class.

Captain T. G. Greet commissioned the cruiser *Rainbow* at Devonport for service with the Cruiser Squadron, to which she will be an addition. This squadron, consisting of the *St. George*, *Juno*, *Brilliant*, *Rainbow*, *Hyacinth*, and *Minerva*, under Commodore Winslow, is due at Malta on January 20. The squadron will leave a week later for Alexandretta, where it will be augmented, for combined exercises, by other vessels belonging to the Mediterranean fleet.

Admiral E. S. Adeane, C.M.G., has been placed on the retired list of his rank. Consequently on this the following promotions have been made:—Vice-Admiral Sir H. F. Stephenson, K.C.B., to be Admiral in His Majesty's Fleet; Rear-Admiral J. W. Brackenbury, C.B., C.M.G., to be Vice-Admiral in His Majesty's Fleet; Captain C. Campbell, C.B., D.S.O., Ad.C., to be Rear-Admiral in His Majesty's Fleet. The following promotion on the retired list has taken place:—Rear-Admiral J. B. Warren to be Vice-Admiral.

The *Hogue*, cruiser, has undergone her contractors' steam trial at four-fifths power with most satisfactory results, and throughout the 30 hours that the ship was steaming at trial speed very rough weather was encountered, but this had little effect upon her machinery. A total horse-power of 16,456 was maintained, producing an average speed of 20.15 knots. The mean results were:—Steam in engines—starboard, 220 lb.; port, 226 lb.; vacuum—starboard—25.6 in.; port, 25.5 in.; revolutions—starboard, 113.1; port, 111.6; pressure in cylinders—high, starboard, 102.5; port, 104.3; intermediate, starboard, 34.7; port, 34.8; low (forward), starboard, 13.3; port, 13.8; low (aft), starboard, 13.5; port, 15.3; i.h.p.—starboard, 8,139; port, 8,137; coal consumption per i.h.p. per hour, 2.05 lb.

The *Bacchante*, first-class cruiser, which was built by Messrs. J. G. Brown & Co., of Clydebank, completed her trials on the 10th ult. The trials, at 4,500 i.h.p. and 16,000 i.h.p., proved very successful. The first full-power trial (21,000 i.h.p.), however, did not succeed, owing to heated bearings, and the vessel had to return to Sheerness to coal and remedy defects. Starting on the 7th ult. the machinery was found to be working well, and the eight-hours' full power trial was commenced. Throughout the vessel behaved admirably, while the machinery worked smoothly, and there was an absence of priming. The results were as follows:—Draught of water—forward, 25 ft. 9 in.; aft, 26 ft. 9 in.; speed of ship, 21.7 knots; steam pressure in boilers, 285 lb. per square inch; vacuum in condensers—starboard, 26.5; port, 26.5; revolutions per minute—starboard, 119.5; port, 120.4; mean i.h.p.—starboard, 10,812; port, 10,708—grand total, 21,520. The coal consumption was 292,800 lb., which represents 1.70 lb. per i.h.p. per hour, as against 1.75 lb. at 16,000 i.h.p.

France.—The *Le Yacht* states, in a description of the latest American boat *Shark*, which is of the same pattern as the British *Holland* boats, that France has always avoided the use of gasoline in the motors, owing to the danger which arises from its presence on board such craft. It is further noted that the American and British boats have only one torpedo tube, whereas the *Narval* has four. At Cherbourg the new submarine *Silure* has just been commissioned for her trials by Lieutenant de Penfentenyo, and it is stated that "our submarines and submersibles are now making frequent trips to sea. The time has come to see that they make their sea trials in a methodic fashion, and to submit them to progressive tests which will enable their true value to be ascertained."

Germany.—The *Cologne Gazette* states that the German navy budget for 1902 provides for the supply of a third river gunboat for China. The two boats at present there, the *Vorwärts* and *Schamien*, were formerly river passenger and cargo boats which were bought from the English during the recent troubles in China, and converted into gunboats. The first was built at Shanghai in 1899 and the second at Hong Kong in 1900. The new boat will be built in Germany and will be the first of the kind ever constructed there. It is destined for the Pei-ho river, where the German flag is at present unrepresented, the gunboats of the *Illis* class not being able to get beyond Tong-ku, the terminus of the railway from Peking. The German Admiralty has under consideration a new type of small cruiser, an improvement on the vessels of the *Gaselle* class. These last have a length of 328 ft.; beam, 38 ft. 7 in.; displacement, 2,660 tons; speed, 22 knots; and a complement of 249 men. The new type will have a length of 360 ft.; beam, 40 ft. 4 in.; displacement, 2,715 tons; speed, 24 knots; and a complement of 260 men. The armament has not yet been decided upon, but it will be more powerful than that of the *Gaselle* type and possess all the latest improvements, full advantage being taken of the results of experiments in other navies.

United States.—The Naval Estimates for the fiscal year ending June 30, 1903, while amounting to nearly \$99,000,000, or \$21,000,000 more than for the present year, only provide for the construction of three additional battleships and two armoured cruisers, as against two battleships and two cruisers in the present year. The largest increase is in the item of docks and shipyards. This is placed at \$20,000,000, as compared with \$6,000,000 allowed in the last Budget. A New York telegram states that the submarine boat *Fulton* underwent further trials on Saturday in Peconic Bay in the presence of Captain Geelmuyden, of the Norwegian Navy. The *Fulton* was first given a surface trial for the distance of a mile, and was then submerged for a longer run, at the conclusion of which two torpedoes were fired at imaginary targets. The trials were

considered to be completely successful, and Captain Geelmuyden is said to be satisfied with the performance of the *Fulton*.

MILITARY.

H.R.H. the Prince of Wales has been appointed to the honorary colonelcy of the 4th County of London Imperial Yeomanry (the King's Colonials).

Lieut.-Colonel James Hayes Sadler, His Majesty's Consul-General for the Somaliland Protectorate, has been appointed His Majesty's Commissioner in Uganda.

The King has been pleased to approve the appointment of Major-General Sir Herbert Charles Chermiside, R.E., G.C.M.G., C.B., to be Governor of the State of Queensland in succession to Lord Lamington.

Major and Hon. Lieut.-Colonel Everard, second-in-command of the 5th Leinster Regiment, the old Royal Meath Militia, has been appointed to command the regiment, which he joined over 30 years ago.

Colonel R. H. W. H. Harris, C.B., half-pay, who was severely wounded in the relief of Ladysmith, has been appointed to the command of the West Riding (33rd) Regimental District from January 1, succeeding Colonel H. B. Le Mottée.

Major Heseltine, Royal Fusiliers, who has recently returned to England from South Africa, has been appointed an extra Aide-de-Camp to Earl Cadogan, K.G., Lord-Lieutenant of Ireland.

Colonel E. H. Baldock, now commanding the Shropshire Imperial Yeomanry, is to be appointed Major, second-in-command of the 3rd (Sharpshooters) County of London Imperial Yeomanry, commanded by the Earl of Dunraven.

Lieut.-Colonel A. Creagh Macdonnell, instructor in surveying at the School of Military Engineering at Chatham, will be succeeded in February next by Major Charles Frederick Close, Royal Engineers, who was formerly connected with the Niger Coast Protectorate.

Sir Partab Singh, of Jodhpur, has been appointed Honorary Commandant of the new Imperial Cadet Corps in India. Of the first batch of native cadets passed in, four are ruling chiefs. The winter camp will be at Meerut—the scene of the outbreak of the Mutiny in 1854.

General French has permitted the use of railway bicycles, which run along the rails, sometimes attaining a speed of 30 miles an hour; and also of a motor railway cycle, which is being built, and will be capable of covering 40 miles an hour. These are used for patrolling purposes.

Colonel George J. Younghusband, C.B., Indian Staff Corps, who originally belonged to the Leicestershire Regiment, and has recently been in command of the 3rd Battalion Imperial Yeomanry at the front, has so far recovered from his wounds that he is returning at once to South Africa, instead of to India, as at first was intended.

The strength of the Russian military railway companies in the Trans-Caspian territory (says the *United Service Gazette*) is to be largely increased, and also the number of companies in the 1st and 2nd Railway Battalions of the Trans-Caspian Army. Each of these latter is now to have a sixth company, the cadres of the new formations being drawn from the Russian European Army. The two companies thus created are to be quartered in the Turkestan military district.

STATISTICAL NOTES.

India.—FOREIGN TRADE.—The following tables, taken from the Monthly Returns of the Trade and Navigation of India, show the imports into and exports from India during six months (April to September) of 1901, as compared with the corresponding period of 1900:—

SUMMARY.

I.—IMPORTS INTO BRITISH INDIA FROM FOREIGN COUNTRIES.

	Six months, 1st April to 30th September.		+ Increase. — Decrease.
	1900.	1901.	
	Rs.	Rs.	Rs.
I. Animals, living . . .	22,15,245	18,39,015	— 3,76,230
II. Articles of food and drink—			
Sugar	2,39,96,488	2,35,64,836	— 4,31,652
Other articles . . .	3,09,26,709	2,67,78,872	— 4,17,837
III. Metals and manufactures of—			
Hardware and cutlery, including plated ware . .	86,94,283	84,28,416	— 2,65,867
Metals	2,88,74,327	3,23,43,204	+ 34,68,877
Machinery and mill-work	1,02,77,907	1,35,02,068	+ 32,24,161
Railway plant and rolling-stock (other than Government stores)	64,43,659	1,23,91,612	+ 59,47,953
IV. Chemicals, drugs, medicines and narcotics, dyeing and tanning materials . .	96,18,277	1,11,47,179	+ 15,28,902
V. Oils—			
Mineral	1,42,10,507	1,88,61,020	+ 46,50,513
Other oils	14,44,070	16,84,975	+ 2,40,905
VI. Raw materials and unmanufactured articles	1,58,06,070	1,60,20,946	+ 2,14,876
VII. Articles manufactured and partly manufactured—			
Cotton yarn	1,16,90,479	1,43,72,748	+ 26,82,269
Cotton piece-goods .	11,46,47,030	14,66,24,749	+ 3,19,77,719
Other articles . . .	5,86,88,280	6,75,74,376	+ 88,86,096
Total merchandise . .	33,75,33,331	39,51,34,016	+ 5,76,00,685
Gold	4,61,16,732	2,39,49,662	— 2,21,67,070
Silver	2,18,92,031	5,05,98,526	+ 2,87,06,495
Grand total of imports .	40,55,42,094	46,96,82,204	+ 6,41,40,110

II.—EXPORTS FROM BRITISH INDIA TO FOREIGN COUNTRIES.

	Six months, 1st April to 30th September.		+ Increase. — Decrease.
	1900.	1901.	
	Rs.	Rs.	Rs.
Foreign merchandise exported	1,48,96,087	1,61,31,747	+ 12,35,660
Indian merchandise exported—			
I. Animals living . .	10,44,048	10,55,665	+ 11,617
II. Articles of food and drink—			
Rice	5,94,49,556	6,13,00,362	+ 18,50,806
Wheat and wheat-flour	21,20,817	2,03,57,624	+ 1,82,36,807
Tea	4,26,53,472	3,96,82,896	— 29,70,576
Other articles . . .	1,25,40,716	1,80,84,320	+ 55,43,604
III. Metals and manufactures of	20,26,418	17,15,699	— 3,10,719
IV. Chemicals, drugs, medicines and narcotics, dyeing and tanning materials—			
Opium	4,87,48,380	4,35,45,710	— 52,02,670
Indigo	20,86,424	32,14,676	+ 11,28,252
Other articles . . .	61,74,401	71,49,076	+ 9,74,675
V. Oils	34,81,673	31,92,300	— 2,89,373
VI. Raw materials and unmanufactured articles—			
Cotton	3,07,68,227	6,21,54,613	+ 3,13,86,386
Hides and skins . .	4,02,12,758	2,98,06,393	— 1,04,06,365
Jute	2,34,36,172	2,38,78,353	+ 4,42,181
Oilseeds	5,82,03,941	10,20,08,426	+ 4,38,04,485
Other articles . . .	3,03,75,502	2,80,13,702	— 23,61,800
VII. Articles manufactured and partly manufactured—			
Cotton yarn	1,49,30,920	4,33,99,419	+ 2,84,68,499
Cotton piece-goods .	73,73,118	70,37,228	— 3,35,890
Hides and skins . .	2,24,46,251	1,45,11,060	— 79,35,191
Jute—bags and cloth	3,84,51,395	4,28,27,810	+ 43,76,415
Other articles . . .	1,38,01,742	1,41,53,448	+ 3,51,706
Total Indian merchandise	46,03,25,931	56,70,88,780	+ 10,67,62,849
Gold	2,21,25,483	1,85,93,533	— 35,31,950
Silver	1,41,06,362	2,35,94,691	+ 94,88,329
Grand total of exports .	51,14,53,863	62,54,08,751	+ 11,39,54,888

United Kingdom.—IMPORTS OF PIG-IRON AND UNWROUGHT STEEL FROM THE UNITED STATES.—According to returns received by the Board of Trade from the Statistical Office of H.M. Customs, London, the quantity and value of pig-iron and unwrought steel registered as imported into the United Kingdom from the United States of America during each of the months of January—November, 1900 and 1901, were as follows:—

I.—PIG-IRON.

	1900.		1901.	
	Quantity.	Value.	Quantity.	Value.
	Tons.	£	Tons.	£
January	5,742	22,898	12,847	48,297
February	2,356	8,905	8,766	28,241
March	4,688	18,101	2,910	11,577
April	1,853	7,544	788	4,602
May	1,629	5,154	1,510	4,332
June	4,829	14,783	346	1,462
July	3,121	13,022	319	1,055
August	7,282	31,140	801	2,596
September	8,829	33,987	355	1,114
October	11,041	45,175	1,261	6,110
November	28,759	99,484	2,374	9,488
Year 1900	Tons 94,282 . .	£ 350,649		
" 1899	" 80,988 . .	£ 219,715		
" 1898	" 76,356 . .	£ 180,614		

II.—UNWROUGHT STEEL.

	1900.		1901.	
	Quantity.	Value.	Quantity.	Value.
	Tons.	£	Tons.	£
January	409	3,988	16,647	98,927
February	369	5,190	16,405	89,817
March	585	4,991	5,804	34,542
April	2,632	18,955	5,275	28,251
May	2,190	17,684	3,247	16,442
June	14,988	109,034	412	3,019
July	10,200	67,108	65	553
August	11,883	84,663	605	4,057
September	21,538	142,796	238	2,137
October	31,217	181,591	572	4,671
November	32,643	198,925	1,050	8,807
Year 1900	Tons 157,628 . .	£ 1,011,851		
" 1899	" 59,375 . .	£ 288,706		
" 1898	" 29,374 . .	£ 158,689		

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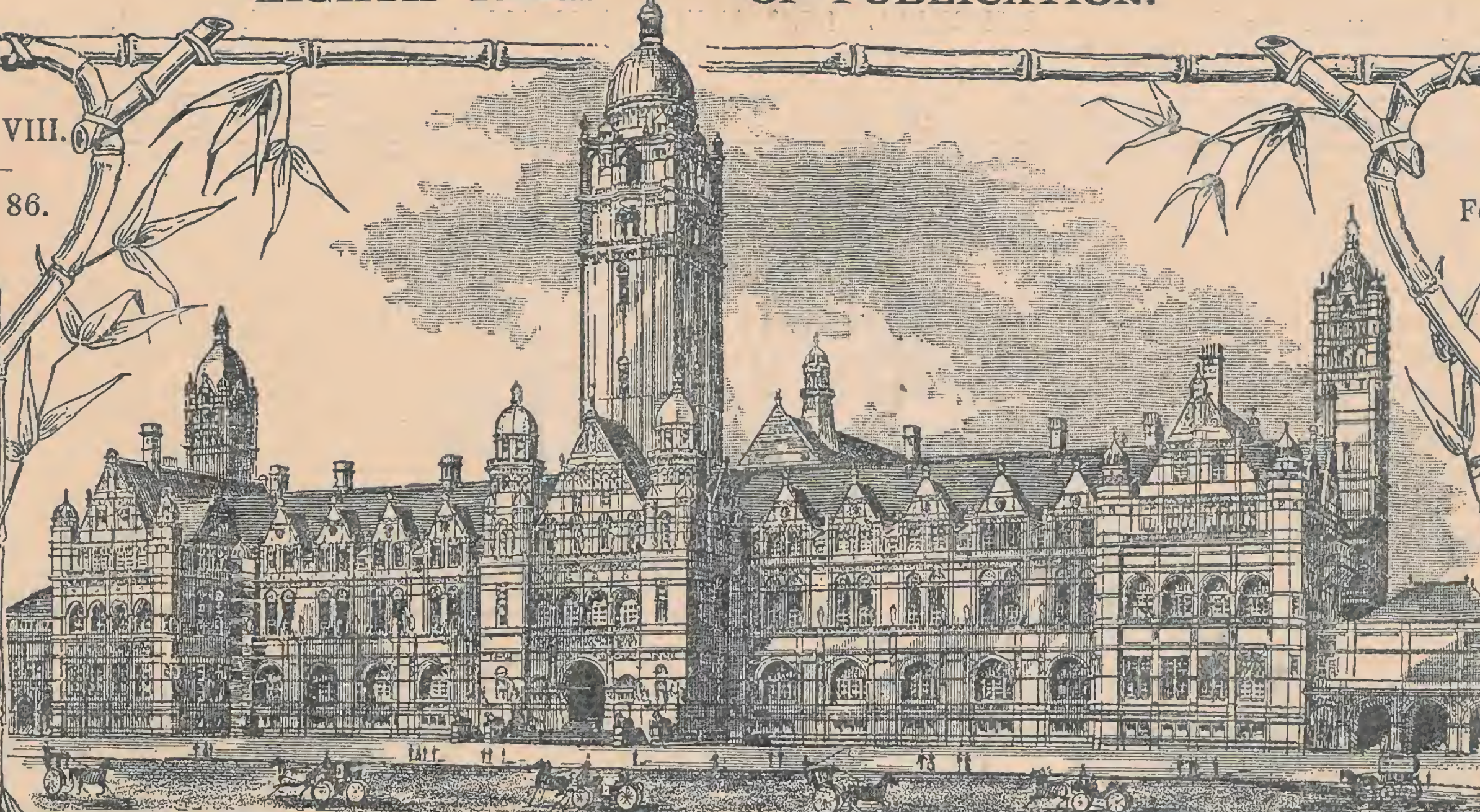
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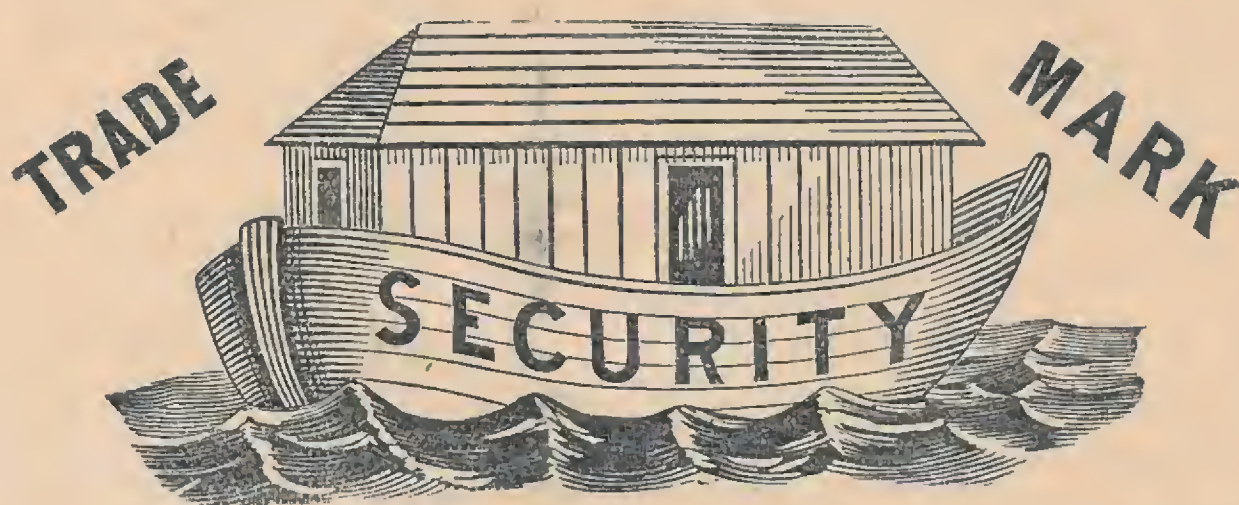
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Corresponding Agent in Colony.—Mr. C. B. LLOYD, Commissioner of Agriculture and Mines, Natal.

Curator of Collection.—(In charge of Institute Staff.)

Products Exhibited.—Agricultural produce, Angora hair, tanning barks, building stones, coffee, cutlery, indigenous timbers, minerals, coal, silk cocoons, spirits, sugar, tea, tobacco, wine, wools, native ornaments, etc., etc.

RHODESIA AND BECHUANALAND.

(West Central Lower Gallery.)

Representative Governors.—Those of CAPE COLONY.

Curator of Collection.—Mr. LEWIS ATKINSON.

[Queen Victoria.

Products Exhibited.—Specimens of native workmanship kindly lent by the late

(West Central Lower Gallery.)

Products Exhibited.—(By the British Central Africa Chamber of Agriculture and Commerce).—Coffee, ivory, *Landolphia* rubber, chillies, *Strophanthus* seeds, beeswax, photographs, etc.

BRITISH AMERICA.

(West and Upper West Central Galleries.)

DOMINION OF CANADA.

Representative Governor.—The Rt. Hon. the LORD STRATHCONA and MOUNT-ROYAL, G.C.M.G., *High Commissioner for the Dominion of Canada.*

Curator of Collections.—Mr. HARRISON WATSON.

PROVINCE OF QUEBEC.

Representative Governors.—The Hon. F. G. M. DECHÈNE and The Rt. Hon. the LORD STRATHCONA and MOUNT-ROYAL, G.C.M.G., *High Commissioner for the Dominion of Canada.*

Corresponding Agent in Province.—The COMMISSIONER OF AGRICULTURE.

Products Exhibited.—Canadian furs from Hudson's Bay Co., stuffed birds, wood pulp, slates, vehicles, minerals (asbestos, apatite, mica, plumbago, etc.), agricultural produce, fruits, tobacco, maple sugar, timber, Indian ornamental work, cotton, linen, and leather, and iron manufactures.

THE COMMERCIAL COLLECTIONS OF THE INSTITUTE—continued.

BRITISH AMERICA—continued.

DOMINION OF CANADA—continued.

PROVINCE OF ONTARIO.

Representative Governors.—SIR HENRY TYLER and JOHN PATON, Esq.

Corresponding Agent in Province.—Mr. ARCHIBALD BLUE, Director of Mines, Toronto.

Products Exhibited.—Agricultural produce, preserved fruits, indigenous timbers, gold, silver, iron, lead, and nickel ores, petroleum, marble, granite and decorative stones, coal, native wines, honey, canned meats, and woodwork.

PROVINCE OF BRITISH COLUMBIA.

Representative Governor.—The Hon. FORBES GEORGE VERNON.

Corresponding Agent in Province.—(At present through Agent-General's Office.)

Products Exhibited.—Agricultural produce, coal, Douglas fir and other timbers, minerals, preserved fruit, tinned salmon, fish oils, woodwork, birds, and animals.

PROVINCE OF NEW BRUNSWICK.

Representative Governor.—C. A. DUFF MILLER, Esq., Agent-General.

Corresponding Agent in the Province.—The PROVINCIAL SECRETARY.

Products Exhibited.—Timbers, minerals, building stones.

PROVINCE OF MANITOBA.

Representative Governor.—The Rt. Hon. the LORD STRATHCONA and MOUNT-ROYAL, G.C.M.G.

Corresponding Agent in Province.—The PROVINCIAL SECRETARY.

Products Exhibited.—Agricultural produce (including barley, beans, corn, oats, peas, rye, wheat, flour, &c.); birds, comprising ducks, grouse, partridges, snipe, etc.; heads of wapiti, cariboo, moose and other large game; specimens of native workmanship, photographs, head-dresses, clubs, arrows, beadwork, etc., etc.

PROVINCE OF NOVA SCOTIA.

Representative Governor.—JOHN HOWARD, Esq., Agent-General.

Corresponding Agent in Province.—(At present through Agent-General's Office.)

Products Exhibited.—Minerals, samples of iron ore and products manufactured from the ore, wood-wool.

NORTH-WEST TERRITORIES.

Representative Governor.—THOMAS SKINNER, Esq.

Corresponding Agent in Province.—(At present through the Representative Governor.)

Products Exhibited.—Grain.

NEWFOUNDLAND.

(Upper West Central Gallery.)

Representative Governor.—[VACANT.]

Corresponding Agent.—

Products Exhibited.—Minerals (including ores of iron, copper, manganese, chromium, lead, antimony and zinc, molybdenite, mispickel, mica, asbestos, steatite, granite, marble, slate, coal, and petroleum) and timber.

BERMUDA.

(Middle of Central Lower Gallery.)

Representative Governor.—Gen. SIR ROBERT BIDDULPH, G.C.B., G.C.M.G.

Corresponding Agent.—THE COLONIAL SECRETARY.

Products Exhibited.—Arrowroot, woods, silk, shell-work, and sandstone.

WEST INDIES.

(West Central Lower Gallery.)

BRITISH GUIANA, TRINIDAD, AND TOBAGO.

Representative Governor.—The Rt. Hon. the LORD STANMORE, G.C.M.G.

Corresponding Agent.—Trinidad and Tobago: THE COLONIAL SECRETARY.

Curator of Collection.—(In charge of Institute Staff.)

Products Exhibited.—Arrowroot, cereals and pulses, medicinal barks, cocoa, coral, coffee, indigenous timbers, lace, fibres, rum, spices, starches, sugars, timber, leather, skins, drugs, fish glue, basket-work, condiments, etc.

JAMAICA AND BAHAMAS, WINDWARD ISLANDS, AND BARBADOS.

Representative Governor.—Gen. SIR HENRY W. NORMAN, G.C.B., G.C.M.G., C.I.E.

Corresponding Agent.—Jamaica: THE INSTITUTE OF JAMAICA.

Hon. Curator.—[VACANT.]

Products Exhibited.—Arrowroot, barks, cocoa, coral, coffee, indigenous timbers, lace-bark, fibres, rum, spices, starches, sugars, sarsaparilla, wax, oils, condiments, turtle, etc.

BRITISH HONDURAS.

Representative Governor.—J. McMURRICH CURRIE, Esq.

Corresponding Agent.—[VACANT.] *Hon. Curator of Collection.*—J. M. CURRIE, Esq.

Products Exhibited.—Banana and cassava meal, cocoanut oil, coffee, horns (deer), indiarubber, Indian corn, medicinal barks, pickles, preserved fruits, rice, rope and cordage of native manufacture, rum, seeds edible and ornamental, spices, sponges, sugar, mahogany and other timbers, tobacco, etc.

LEEWARD ISLANDS.

Representative Governor.—[VACANT.]

Corresponding Agents.—Grenada: THE COLONIAL SECRETARY.

St. Vincent: THE ADMINISTRATOR. *St. Lucia:* MR. T. H. DIX.

Products Exhibited.—Arrowroot, barks, cocoa, coral, coffee, indigenous timbers, fibres, rum, spices, starches, sugars, etc., etc.

FALKLAND ISLANDS. (Middle of Central Lower Gallery.)

Representative Governor.—Gen. SIR ROBERT BIDDULPH, G.C.B., G.C.M.G.

Corresponding Agent.—THE COLONIAL SECRETARY.

Products Exhibited.—Wool, birds' skins and eggs.

BRITISH AUSTRALASIA.

NEW SOUTH WALES.

(East Central Upper and Lower Galleries.)

Representative Governor.—The Hon. HENRY COPELAND (Agent-General), and SIR DANIEL COOPER, Bart., G.C.M.G.

Corresponding Agent in Colony.—(At present through Agent-General's Office.)

Products Exhibited.—Minerals (including gold, silver, coal, &c.), wool, indigenous timbers, wines, cereals, seeds, gums, resins, oils, fibres, rope, leather, tallow, etc., etc.

VICTORIA.

(East Central Upper and Lower Galleries.)

Representative Governors.—Lieut.-General the Hon. SIR ANDREW CLARKE, G.C.M.G., C.B., C.I.E. (Agent-General), and HOWARD SPENSLEY, Esq.

Corresponding Agents in Colony.—(At present through Agent-General's Office.)

Officer in Charge of Collection.—Mr. A. G. BERRY (of the Agent-General's Office.)

Products Exhibited.—Animals, birds, coal, cereals, chemical manufactures, cigars, essential oils, gums, grain, hops, indigenous timbers, leather, leatherware, minerals (including auriferous quartz, coal, kaolin, etc.), models of gold nuggets, seeds, sugar, tobacco, wines, wool, etc., etc.

SOUTH AUSTRALIA.

(East Central Lower Gallery.)

Representative Governors.—H. A. GRAINGER, Esq. (Agent-General), and HENRY BULL TEMPLAR STRANGWAYS, Esq.

Corresponding Agent in Colony.—(At present through Agent-General's Office.)

Officer in charge of Collection.—Mr. EDMUND SNELL (of the Agent-General's Office.)

Products Exhibited.—Agricultural produce, wines, indigenous timbers, furniture, wool, etc.

QUEENSLAND (AND BRITISH NEW GUINEA).

(East Central Lower Gallery.)

Representative Governors.—The Hon. SIR HORACE TOZER, K.C.M.G. (Agent-General), and Gen. SIR HENRY W. NORMAN, G.C.B., G.C.M.G., C.I.E.

Corresponding Agent in Colony.—(At present through Agent-General's Office.)

Curator of Collection.—(In charge of Institute Staff.)

Products Exhibited.—Building stones, eucalyptus oils, fibres, minerals, pearl shells, indigenous woods, cereals, models of fruits, sugar, wine, tinned meats, hides, skins, leather, etc., etc.

WESTERN AUSTRALIA. (East Central Lower Gallery.)

Representative Governor.—The Hon. H. B. LEFROY (Agent-General).

Corresponding Agent in Colony.—(At present through Agent-General's Office.)

Curator of Collection.—(In charge of Institute Staff.)

Products Exhibited.—Wools, gums and resins, olive oil, fibrous barks, silk, skins, indigenous woods, minerals, model gold ingots, etc., etc.

TASMANIA. (East Central Lower Gallery.)

Representative Governor.—The Hon. ALFRED DOBSON (Agent-General).

Corresponding Agent in Colony.—Mr. T. C. JUST, Chief Secretary's Office, Hobart.

Curator of Collection.—(In charge of Institute Staff.)

Products Exhibited.—Cereals, minerals, models of fruits, stuffed fish, furs, timbers, illustrations of local manufactures, etc., etc.

NEW ZEALAND. (East Central Lower Gallery.)

Representative Governors.—The Hon. W. P. REEVES (Agent-General), and THOMAS MACKENZIE, Esq. *Corresponding Agent in Colony.*—(At present through Agent-General's Office.) *Curator of Collection.*—(In temporary charge of Institute Staff.)

Products Exhibited.—Agricultural produce, building stones, coal, Kauri gum, hemp and flax, tinned meats, wools, tobacco, Kauri and other woods, with illustrations of their application to structural and ornamental purposes; photographs, etc., etc.

FIJI. (Middle of Central Lower Gallery.)

Representative Governor.—Gen. SIR ROBERT BIDDULPH, G.C.B., G.C.M.G.

Corresponding Agent in Colony.—Hon. JOHN HILL, Suva.

Curator of Collection.—(In charge of Institute Staff.)

Products Exhibited.—Barks, fibres, copra, tea, cocoa, coffee, timbers, etc.

BRITISH INDIA (AND ASIA).

INDIA. (East Gallery and Pavilion.)

Representative Governors.—Vide p. 32.

Special Sub-Committee, in charge of the Indian Section (appointed by the Secretary of State for India in Council):—*Chairman:* Major-General SIR OWEN TUDOR BURNE, G.C.I.E., K.C.S.I.

Members: SIR GEORGE C. M. BIRDWOOD, K.C.I.E., C.S.I.; G. W. VIDAL, Esq., I.C.S.; SIR E. C. BUCK, K.C.S.I.; W. COLDSTREAM, Esq., I.C.S., B.A.; C. H. MOORE, Esq.; T. W. HOLDERNESS, Esq., C.S.I.; SIR CHARLES J. LYALL, K.C.S.I., C.I.E.; Major-General JAMES WATERHOUSE.

Secretary: Mr. J. R. ROYLE, C.I.E.

Channel of Correspondence.—THE REVENUE AND AGRICULTURAL DEPARTMENT, INDIA.

Curator of Collection.—Mr. J. R. ROYLE, C.I.E.

Products Exhibited.—Fodder grasses, foods and food stuffs, sugar, spices and condiments, models of fruits, narcotics (including opium, ganja, etc.), tobacco and cigars, tea and coffee, oils and oil-seeds (including those of castor, sesamum, linseed, cocoa-nut and ground nut, etc.), a large assortment of drugs, dyes and tans, gums and resins (including the resins and turpentine of Indian pines, wax, lac, etc.), an extensive collection of fibres (including cotton, silk, jute, coir, reha, agave, etc.), models illustrating the manufacture of cotton and jute, minerals (including building stones, coal, mica, soapstone, corundum, iron ores, steel, etc.), timbers, collection of Indian pottery, carved woodwork, silver, brass and copper ware, silk and cotton fabrics.

CEYLON. (East Gallery.)

Representative Governor.—The Rt. Hon. the LORD STANMORE, G.C.M.G.

Executive Officer and Home Agent.—FREDK. H. M. CORBET, Esq., Barrister-at-Law.

Curator of Collection.—Mr. J. R. ROYLE, C.I.E.

Products Exhibited.—Cereals, pulses, edible fruits, roots and grains, spices and condiments, drugs, horns, skins, pearls, shells, wax, oils, gums, resins, dyes, tans, fibres, timbers, building stones, plumbago, metallic ores, rough gems, palm products, tea, coffee, cocoa, cinchona bark, sugar, tobacco, cotton-cloth, mats, rattan and basket work, wood and ivory carving, metal-work, pottery, tortoise-shell and porcupine quill work, lacquer work, lace, etc., etc.

STRAITS SETTLEMENTS (AND JOHOR).

(East Gallery.)

Representative Governor.—SIR CECIL CLEMENTI SMITH, G.C.M.G.

Corresponding Agents.—The COLONIAL SECRETARY (at Singapore); The Dato JAMES MELDRUM (for Johor). *Curator of Collections.*—(In charge of Institute Staff.)

Products Exhibited.—Barks, canes, drugs, fibres, preserved fruits (including Singapore pine-apples), mats, silk fabrics, oils and oil-seeds, dyes and tans, gums, gutta-percha, tin ores and other minerals, teas, coffee, spices, timbers, etc., etc.

MAURITIUS (AND SEYCHELLES).

(West Central Lower Gallery.)

Representative Governor.—[VACANT.]

Corresponding Agent in Colony.—Mr. A. DARUTY DE GRANDPRÉ, Museum Superintendent.

Corresponding Agent for Seychelles.—The Hon. E. B. SWEET-ESCOTT, C.M.G., Administrator.

Curator of Collection.—(In charge of Institute Staff.)

Products Exhibited.—Fibres, hemp, oils, rum, seeds, sugars, tortoise-shell, vanilla beans, with specimens of native workmanship, etc., etc.

HONG KONG. (Middle of Central Lower Gallery.)

Representative Governor.—SIR WILLIAM ROBINSON, G.C.M.G.

Corresponding Agent in Colony.—The HARBOUR MASTER.

Curator of Collection.—(In charge of Institute Staff.)

Products Exhibited.—China, carved and inlaid ivory and wood-work, silver and lacquer ware, silk and cotton fabrics, drugs, paints, dyes, food stuffs, etc., etc.

BRITISH NORTH BORNEO. (West Central Lower Gallery.)

Corresponding Agent.—(At present through the British North Borneo Co.)

Curator of Collections.—(In charge of Institute Staff.)

Products Exhibited.—Timbers, rattans, coal, rice, sago, sugarcane and raw sugar, coffee, cocoa pods, pepper, tobacco, beeswax, camphor, gutta-percha, kapok fibre, dammars, cutch and gambier, hemp, honey, etc.

BRITISH POSSESSIONS (EUROPE).

MALTA, GIBRALTAR, AND CYPRUS.

(West Central Gallery.)

Representative Governor.—Gen. SIR ROBERT BIDDULPH, G.C.B., G.C.M.G.

Corresponding Agent.—(At present through the Representative Governor.)

Curator of Collections.—(In charge of Institute Staff.)

Products Exhibited.—From Malta—Carved stone-work, lace, macaroni, honey, various fabrics, models, pictures, etc., etc. Gibraltar and Cyprus—None at present.

IMPERIAL INSTITUTE JOURNAL.

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FEBRUARY, 1902.

GENERAL NOTICES.

"THE IMPERIAL INSTITUTE JOURNAL."

An ornamental Cloth Cover, for binding the numbers of the JOURNAL for the year 1901 into one volume, may be obtained at the TICKET OFFICE of the INSTITUTE, or from Messrs. WATERLOW AND SONS LIMITED, Blomfield-house, London-wall, E.C., price 2s. 6d. Bound volumes of the JOURNAL for the seven years, 1895-1901, may be had at 10s. each.

Fellows resident in the United Kingdom, the Colonies, India, and Foreign Countries, are supplied with the JOURNAL free by post each month.

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The JOURNAL may also be purchased for Sixpence each copy at the Ticket Office of the Institute and at the railway book-stalls of Messrs. WILLING & CO.

The City Agents for the JOURNAL are Messrs. WILLING & CO., 17, Royal Exchange, London, E.C. It may also be obtained at the offices of the printers, WATERLOW & SONS LIMITED, Blomfield-house, London-wall, London, E.C.

Communications respecting Advertisements should be addressed to the ADVERTISEMENT MANAGER, 6, Arundel-street, Strand, London, W.C.

 This JOURNAL is distributed (by post) throughout the United Kingdom, India, and the Colonies of the British Empire, and to the following Foreign Countries:—Argentina Republic, Austria-Hungary, Belgium, Bolivia, Chili, China, Colombia, Costa Rica, Denmark, Egypt, France, Germany, Greece, Hawaiian Islands, Holland, Italy, Japan, Mexico, Montenegro, Morocco, Norway, Persia, Peru, Portugal, Russia, Siam, Spain, Sweden, Switzerland, Tripoli, Turkey, United States of America, Uruguay, and Venezuela. The JOURNAL is also placed in the Reading Rooms of CHAMBERS OF COMMERCE, CLUBS, and HOTELS, both at home and abroad.

THE FELLOWS' DEPARTMENT.

The Reading, Writing, and News Rooms, are open for the use of Fellows every week-day from 10 a.m. till 11.30 p.m., and on Sundays from 3 p.m. to 10.30 p.m. The Library (on the First Floor), is open from 10 a.m. to dusk on Week-days, and from 3 p.m. to dusk on Sundays. The Map Room (First Floor) is open from 10 a.m. to 5 p.m. on Week-days.

The Poste Restante is open every week-day for receipt and delivery of letters and parcels. Letters addressed to initials only are not received, except in reply to notices in the JOURNAL, under "Requirements" Registry. The General Post Office Pillar Box is cleared daily twelve times, between 10.10 a.m. and midnight.

Light refreshments only are, for the present, provided in the Fellows' Rooms and at the bar of the Ceylon Kiosk.

LECTURE AND CONCERT ARRANGEMENTS.

LECTURES.

An Illustrated Public Lecture will be given on every Monday evening during the remainder of the season. The following have been arranged for February:—

Mon., 3rd Feb., at 8.30 p.m. "The Native Races of Nigeria," by C. F. HARFORD-BATTERSBY, Esq., M.D., Principal of Livingstone College. *In the Chair:* T. F. V. BUXTON, Esq., J.P.

Mon., 10th Feb., at 8.30 p.m. "The Coloured Races in Australia," by the Hon. Sir HORACE TOZER, K.C.M.G., Agent-General for Queensland. *In the Chair:* The Right Hon. LORD LAMINGTON, G.C.M.G., late Governor of Queensland.

Mon., 17th Feb., at 8.30 p.m. "The Obstacles to Development in West Africa," by C. F. HARFORD-BATTERSBY, Esq., M.D., Principal of Livingstone College. *In the Chair:* Admiral the Right Hon. Sir JOHN DALRYMPLE HAY, Bart., K.C.B., F.R.S.

Mon., 24th Feb., at 8.30 p.m. "British Columbia," by the Hon. J. H. TURNER, Agent-General for British Columbia.

The fixtures for the subsequent Monday evenings of the Lecture Season will be announced in due course.

Admission to the Lecture-Hall by the first entrance to the Imperial Institute coming from Exhibition Road.

Seats are reserved for Fellows, who have also the privilege of admitting two Friends for each Lecture, or Address, by reserved seat tickets.

CONCERTS.

The EVENING CONCERTS for Fellows and their friends will be continued during the Winter Season, 1901-2, and will take place in the JEHANGIER HALL on certain Wednesday evenings, the dates of which will be announced in due course.

The following Concerts will take place this month:—

Wed., 5th February, 8.30 p.m. CONCERT by the IMPERIAL INSTITUTE (AMATEUR) ORCHESTRA. *Chairman of Orchestral Committee,* FRANK H. BUTLER, Esq. *Hon. Leader,* LOUIS H. D'EGVILLE, Esq. *Hon. Conductor,* A. RANDEGGER, Esq.

The programme will include the following:—

SYMPHONY IN B MINOR (unfinished)	Shubert.
INTRODUCTION TO ACT III. "Tannhauser"	Wagner.
SONG CYCLE "Summer Time"	Landon Ronald.
(Conducted by the Composer).	
OVERTURE "Rienzi"	Wagner.
JUDEX "From 'Mors et Vita'"	Gounod.
VALE "Schatz"	Johann Strauss.
PIANOFORTE CONCERTO, No. 2, IN G MINOR, Op. 22	Saint-Saëns.
MISS MARGUERITE ELZY.	

Vocalist . . . MR. HENRY BOULDERSON.

Wed., 19th February, 8.30 p.m. CONCERT by the STUDENTS of the ROYAL ACADEMY OF MUSIC, under the direction of Sir ALEXANDER C. MACKENZIE, Mus.Doc., LL.D., F.R.A.M.

Fellows have free admission to the Concerts, and can purchase tickets at 2s. 6d. each) for the admission of their Friends.

THE SCIENTIFIC AND TECHNICAL DEPARTMENT.

The Scientific and Technical Department of the Institute has been established to acquire information by special enquiries and by experimental research, technical trials and commercial valuation regarding new or little known natural or manufactured products of the various Colonies and Dependencies of the British Empire and of foreign countries, and also regarding known products procurable from new sources, and local products of manufacture which it is desired to export. This work is carried out with a view to the creation of new openings in trade, or the promotion of industrial developments.

In the extensive and well-equipped series of Research Laboratories occupying the West Corridor of the Second Floor, a staff of skilled Chemists, under the direction of Professor Wyndham R. Dunstan, M.A., F.R.S., carry out the investigation of the chemical constitution and properties of new dye, stuffs, tanning materials, seeds and food-stuffs, oils, gums and resins, fibres, timbers, medicinal plants and products; animal products, minerals and ores-soils, cements, and various other products, with a view to their commercial utilization. Whenever necessary these materials are submitted to special scientific experts, by whom they are made the subjects of particular investigation or practical tests. Reports are also obtained from technical or trade-experts in regard to the probable commercial or industrial value of any such products, whilst full information is collected from official or other trustworthy sources regarding the probable extent and cost of available supplies. All materials requiring scientific or technical examination, or commercial valuation, should be submitted to the Institute for examination either by, or through, the Foreign Office, the Colonial Office, the India Office, or the Board of Trade, or through the Colonial or Indian Government Authorities. Requests for the examination of such materials may also be submitted by Public Commercial Bodies and Institutions of the respective Colonies and Dependencies, or by the Representatives of H.M. Government in foreign countries.

COMMERCIAL INTELLIGENCE DEPARTMENT.

The Office of this Department, in the West Corridor, First Floor, is open daily from 10 a.m. to 5 p.m. (on Saturdays till 1 p.m.), for the purpose of answering enquiries and supplying information relating to the Commerce (Export and Import) and Industries of India and the Colonies. Applications may be made personally or by letter. Special information may be obtained from the Curators in charge of the Indian and of certain Colonial Collections. Arrangements have been made for the translation for mercantile firms of Trade Circulars, Price-Lists, and Catalogues into any Foreign Language, including the conversion of weights, measures and coinages, etc., at cost price, and application for such may be addressed to this Department.

THE COMMERCIAL COLLECTIONS.

The Galleries containing the Colonial and Indian Collections, and the Public Commercial and Industrial News Room, are open for free inspection by the public daily, *except Sundays, and any days specially notified*, from 11 a.m. until 4 p.m. Every information concerning the products, their supply, etc., can be obtained on application to the Curators of the Indian and Ceylon, Canadian, and South African Sections, to the general Curator, and to the Commercial Intelligence Department.

CITY BRANCH OF THE IMPERIAL INSTITUTE.

The City Branch of the IMPERIAL INSTITUTE, at 112, Cannon-street, E.C., is open to Visitors on week-days from 10 a.m. till 5 p.m. The Branch includes a News Room, supplied with many British and Foreign Commercial Publications, Market Reports, etc., and an Enquiry Office in telephonic communication with the Commercial Information Office of the Imperial Institute. The News Room and Enquiry Office are free to Fellows of the Institute; other persons are admitted on payment of £1 annually.

Subscribers are entitled to inspect, *free of charge*, any maps or charts included in the Map Room collection at the Imperial Institute, South Kensington, and to consult any works, or official papers, included in the Institute Library.

The Information Department will undertake to obtain analytical or other examinations of samples by competent Experts, upon payment, by persons submitting them, of the usual professional fees, to be previously specified, and agreed to by the applicant. (*For further information see page 48*).

THE NORTHBROOK SOCIETY.

The Northbrook Society is affiliated to the Imperial Institute, and has a special room allotted for the exclusive use of its members in the Institute buildings. Its primary objects are to watch over and promote the interests of natives of India, and to provide a system of guardianship or supervision over such as are sent to Europe for education. The Society is controlled by a committee consisting of an equal number of Governors of the Imperial Institute and members of the Society, presided over by the Earl of Northbrook. It possesses an excellent library. Indian members, who pay no subscription to the Society, have the especial advantage of becoming Fellows of the Institute at half the usual subscription payable by the ordinary Fellows. Applications for membership of the Society should be addressed to the Secretary of the Northbrook Society, Imperial Institute, London, S.W.

EMIGRATION INFORMATION OFFICE.

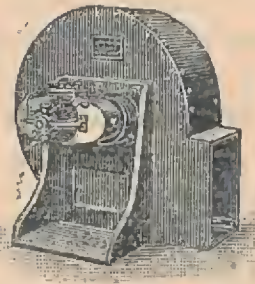
The Office of the British Women's Emigration Association (*see page 50*), in the West Corridor, First Floor, is open daily from 10 a.m. to 4 p.m., and advice and information respecting emigration and openings in the Colonies may be obtained there free of charge. Enquiries of all kinds relating to the Colonies from intending Emigrants are dealt with in the Commercial Intelligence Department, and special information respecting Canada and the Cape Colony may also be obtained from the Curators for these Colonies, on application personally at their offices, or by letter.

FANS

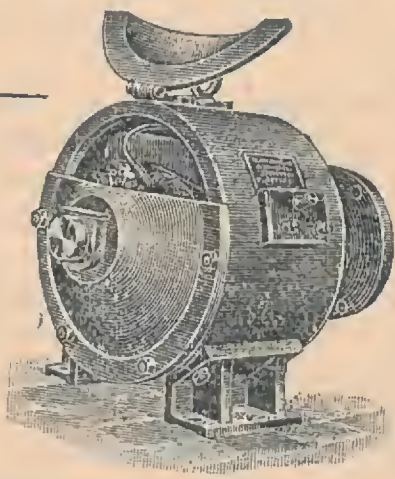
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NOTICE.—For the early information and convenience of Shipowners, Captains, and others, ALL NEW ADMIRALTY CHARTS that may be published from time to time are noted every Monday in the *Shipping Gazette and Lloyd's List* on page 7; in the *Shipping Gazette and Lloyd's List Weekly Summary* every Friday, on page 1; and in the *Lloyd's Weekly Shipping Index* every Friday, on page 3 of Cover. The new and corrected Admiralty Charts are also noted in the following weekly and monthly journals:—*The Syren, The Nautical Magazine, The Geographical Journal, The Shipping World, The Mariner, THE IMPERIAL INSTITUTE JOURNAL*, and *The Steamship*, etc., etc.
Copies of the CHARTS can be obtained by applying to J. D. POTTER.



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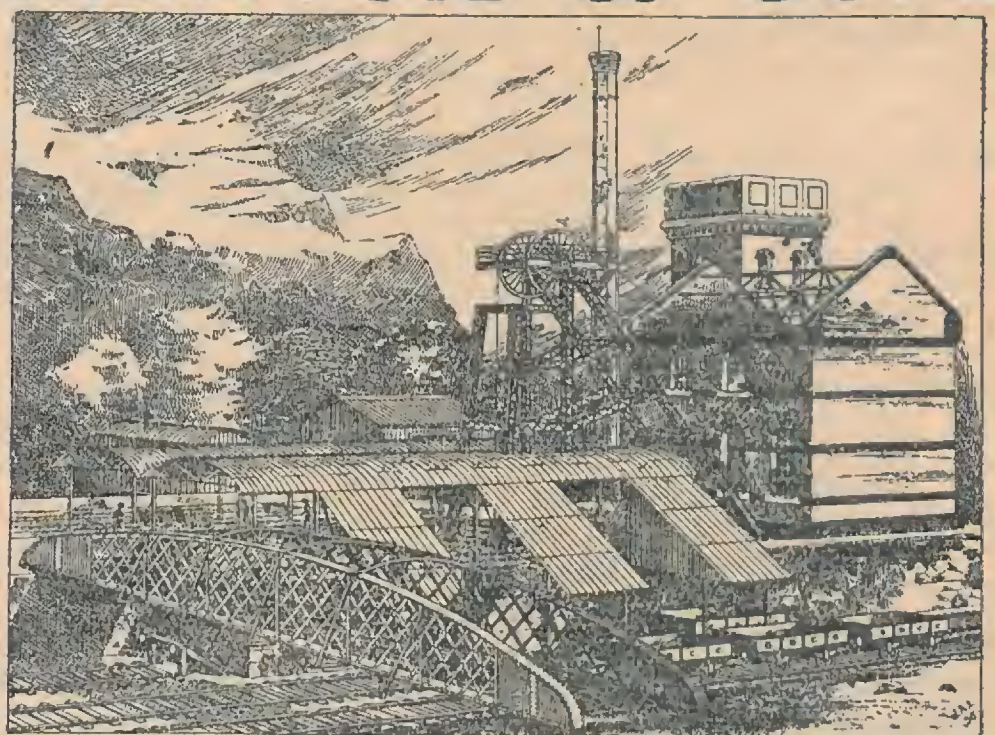
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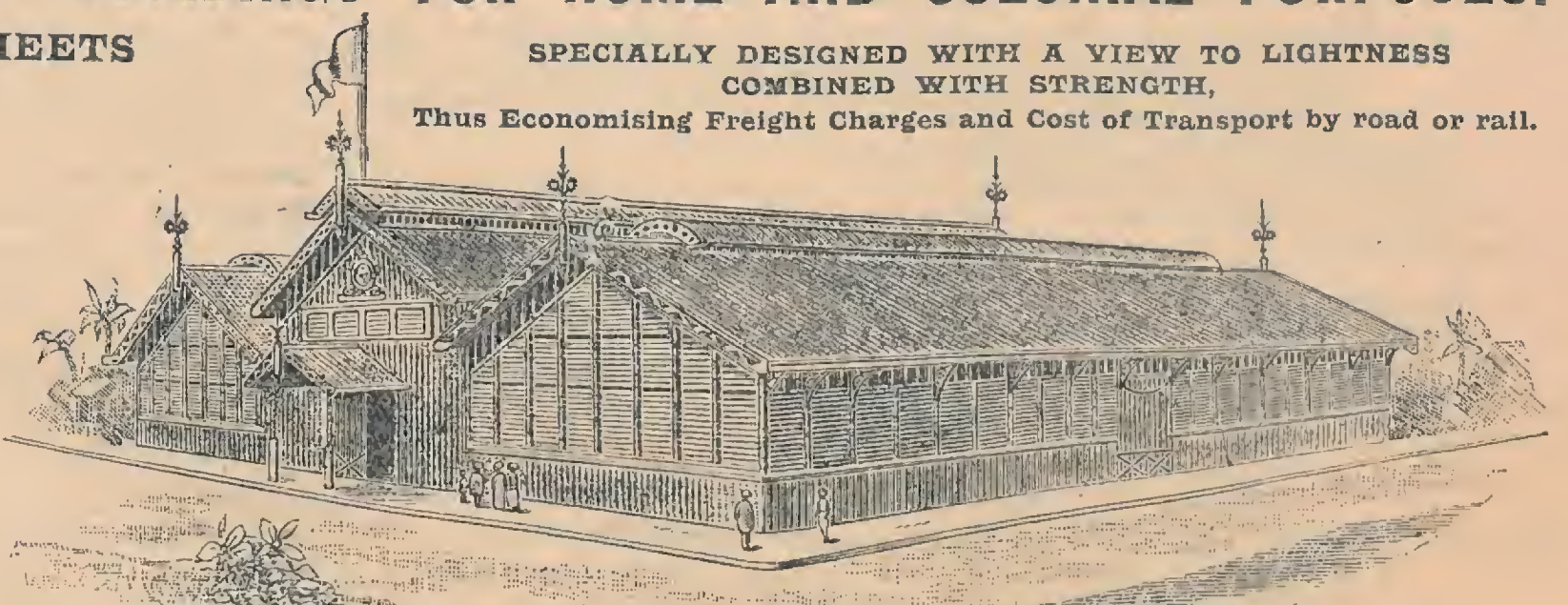
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THE IMPERIAL INSTITUTE.

SPECIAL MEETING OF THE GOVERNING BODY.

A very important Meeting of the Governors of the Imperial Institute was held on Saturday the 21st December, 1901, at York House, St. James's Palace, under the Presidency of HIS ROYAL HIGHNESS THE PRINCE OF WALES.

The following Members of the Governing Body were present:—H.R.H. The Prince Christian, Lord James of Hereford, The Lord Chancellor, Lord Kelvin, The Earl of Crewe, Lord Sandhurst, Lord Iveagh, Sir Frederick Abel, Colonel W. T. Makins, Sir Robert Herbert, Sir Charles Elliott, Sir J. Wolfe Barry, Mr. F. A. White, Mr. A. Prevost, Mr. J. M. Paulton.

Representing the Government of India.—Sir Owen Tudor Burne, Sir James Peile, Sir Henry Bliss, Sir Stuart Bayley, Sir F. F. Adam, Sir Raymond West, Mr. A. Cadell, Mr. J. S. Gamble, Mr. W. Coldstream, Mr. W. C. Bennett, Mr. G. W. Vidal, Mr. T. W. Holderness.

Representing Canada.—Sir Henry Tyler, Mr. Thos. Skinner, Mr. C. A. Duff Miller.

Representing New South Wales.—The Hon. H. Copeland.

Representing Tasmania.—The Hon. A. Dobson.

Representing Cape Colony.—The Hon. Sir David Tennant.

Representing Natal.—Sir Walter Peace.

Representing Hong Kong.—Sir Wm. Robinson.

Representing Straits Settlements.—Sir Cecil Smith.

Representing Gibraltar, Malta, Cyprus, Bermuda, Fiji, Falkland.—Gen. Sir Robert Biddulph.

Representing Jamaica, Bahamas, Windward Islands, Barbados.—Sir Henry Norman.

Representing British Honduras.—Mr. J. M. Currie.

Representing the South-eastern, Midland, and Northern Districts of England.—Mr. R. M. Littler, Mr. F. Elkington, Sir Lowthian Bell, Sir B. C. Browne.

Representatives for the time being of Associations.—Sir John Evans, Sir John Watney, Mr. J. E. Reynolds, Mr. Geo. Beilby, Mr. W. J. Davis, Mr. C. D. Higham, Mr. W. H. Maw, Mr. Chas. Hawkesley.

Letters expressing regret at inability to attend were received from the following Governors:—The Archbishop of Canterbury, The Lord Chief Justice, The Lord Mayor of London, The Earl of Ducie, Lord Elgin, Lord Rothschild, Lord Strathcona, Sir Henry Fowler, The Lord Provost of Edinburgh, Sir J. Taubman-Goldie, The Hon. R. A. Grainger, Mr. J. I. Rogers, Sir Henry Waring, Sir Daniel Cooper, Mr. Wm. Emerson, Mr. Austin R. Whiteway, Sir James Musgrave, Sir Wm. H. Preece, Mr. Howard Spensley, Sir Wm. Houldsworth, Mr. John R. Wigham, Sir John Llewelyn, Mr. W. Langdon.

Sir Horace Tozer (Queensland) also expressed regret at having been accidentally prevented from attending.

In opening the proceedings, the Prince of Wales said:—Your Royal Highness, My Lords and Gentlemen, you must permit me to say what great satisfaction I have in presiding over you to-day, as the President of the Imperial Institute. I naturally recall the great interest taken in its foundation and fortunes by our late beloved Sovereign. As you know, I have had many opportunities of witnessing the practical interest ever taken in your proceedings by the King, and I hope that you will also consider that I have not been myself entirely unmindful of your interests. It, therefore, gives me very great pleasure to find myself presiding over so important a gathering.

For the present, I have only to inform you that matters of great importance connected with the Institute will be brought to your notice. I will now ask Lord James to explain the proposals to be submitted to you.

LORD JAMES OF HEREFORD said:—Your Royal Highnesses, my Lords and Gentlemen, I am quite sure, Sir, that my colleagues on the Governing Body of this Institute would wish that the first words to be addressed to you should convey very grateful acknowledgment of the fact that you have accepted the Presidentship of our Institute. The objects of this Institute, the great interest ever taken in its fortunes by our beloved great Queen, the practical interest in our affairs that His Majesty has ever shown to us,—have all conduced to the one central feeling that you, and you alone, Sir, could fittingly occupy the Presidentship of the Institute. And having gratefully thanked you for this, I will now submit to the Governing Body matters which you have rightly described as of grave importance to the future fortunes of the Institute.

In order to fully explain the nature of the suggestion—and it is only a suggestion—which I have to submit for the consideration of the Governing Body—a short retrospect will be necessary. It will be recollected that, by its Charter, the objects of our Institute were declared to be: to increase the commercial dealings of the nation; to provide intelligence regarding its commerce, and to bring together the further ends of that great Empire over which Her Majesty QUEEN VICTORIA had so beneficently ruled for fifty years. That was the primary object of our creation. But when we came into existence, acting under our Charter, certain other objects, which seemed to be advisable, were carried into effect; and all of us, taking the responsibility of such policy, endeavoured to combine with the commercial objects to which I have referred, the creation of something of a popular and attractive nature existing within the Institute itself. That policy was one in which my great friend the late Lord Herschell took deep interest; and, together with him, we endeavoured to carry it into effect. Well, you will recollect that some three years ago, we found that that portion of our policy was a failure. It had produced financial difficulties so great that we saw not how they could be overcome, unless certain action in a new direction was taken—and we took it. We were losing four or five thousand pounds a year by giving the public entertainments, and they were brought to an end. Then we relieved ourselves of great burdens by assigning to the Government a portion of our Buildings, and also our liabilities. As I stated last year, this change of policy has been actually and entirely successful, with the result that, in consequence of our exemption from pecuniary liabilities, our relief from the payment of about £4,000 a year for parochial rates, taxes, etc., and having our building secured to us, with external repairs and cost of heating defrayed by the Government, we are now in this fortunate position,—that we have an excess of income over expenditure of at least £2,000 a year. We are in a financial position of thorough soundness. Our property is relieved of all debt, and we possess property in buildings, site and collections, absolutely unrivalled, with invested funds amounting to £1,400,000. The property at our disposal certainly amounts to about half-a-million of money. Being in such a satisfactory position, I am sure the Governing Body will agree with me that it is absolutely necessary to see that these great resources are not wasted. We have to carry out the primary objects of our Charter, and we must set ourselves to accomplish this task. And so we set to work and sought the aid of those who could help us most; we appealed to Lord Salisbury, who gave us one of his ablest representatives; to Mr. Chamberlain, who also nominated a representative of his department, whom he thought would be the most active; to the India Office, who also rendered us assistance. And so we formed an Advisory Committee, with the object of working hard in disseminating information of commercial value. We have sought to go into every colony, and appeal to its Government; and, through the Foreign Office, have requested our Consuls in every foreign town to disseminate amongst foreign communities a

knowledge of our commerce. We have invoked the India Office, and have also appealed to the Board of Trade to see what could be done at home.

When we approached the Board of Trade we found a strange state of things existing. It had formed a Consultative Committee from exactly the same sources that we had; it had also appealed to the Foreign, Colonial and India Offices for representatives. And, as we had appealed to the Board of Trade for assistance, so the Board of Trade appealed to the Institute to help them, and thus Sir Frederick Abel had actually been called upon to guide and assist the Board of Trade in their councils. Also, strangely enough, whilst the agencies were similar, the objects were precisely the same. The Authorities of the Board of Trade wished to go to the Colonies; they wished to go to the Foreign Office, to the Chambers of Commerce here in England, to effect exactly the same objects as those which we had in view. The position had thus reduced itself to this: we had given up entertainments, we had concentrated our force upon strictly commercial intelligence objects, but now we found ourselves walking exactly on the same path in the same field, and appealing to the same people as that great and powerful body the Board of Trade. Now this is the relative position. The Board of Trade was a Government Department, and, as representing the nation, they have a great goodwill and power we do not possess; they can speak in the name of their Government; their Colonial Committee can speak in the name of the Colonial Office; their Foreign Committee in the name of the Foreign Office, and so on. So, of course, this important public body possesses great advantages over us, a semi-public body. But, whilst they have this goodwill and great power in comparison with us, we have a great power in comparison with them. We are in possession, at this moment, of an annual contribution of £2,000 from the Royal Commissioners for the Exhibition of 1851, which we have undertaken to devote to the maintenance of laboratories which, I believe, both in their guidance and results, are unique in acquiring scientific knowledge of commercial importance. The results of the researches there carried out, and of their commercial value and application, are sent out to the world through our Commercial Intelligence Department. Well, the Board of Trade is wanting in such a Scientific and Technical Department. We have, beyond this, a magnificent group of forty-two collections, representing the products of our great dependency, India, and of all our different Colonies—a collection unrivalled in the world, because there is no other empire which can secure such a gathering of products from its great constituent bodies. There is also still vacant space in the galleries at the disposal of the Imperial Institute to extend the scope of our operations.

Now, Sir, what is the result of all this? We are in direct competition with the Nation through the Board of Trade; we find ourselves in danger of being beaten wherever we go. Now, they, on the other hand, require assistance to make their action perfect and complete, and what they—the more fortunate Board of Trade—require, is the means of forming a dépôt, a Clearing-house of Commercial Products; a Sampling-house; this we have at our disposal, while they possess a powerful agency which we do not. And now, Sir, we, who have charge of the immediate action of the Institute, find ourselves with its great objects in view, and these great means of carrying them out; but, at the same time, face to face with a competition against which, speaking frankly, we shall have great difficulty in successfully contending. It is a useless competition, and an unsatisfactory competition, even if we succeeded, but it is more useless and more unsatisfactory if we make the attempt to succeed and then fail. Speaking for Sir Frederick Abel and myself, we have come to the conclusion, in considering how best the purposes for which the Institute was founded can be carried into effect, that it is our duty to submit to the Governing Body of the Institute, for consideration, two proposals which will, we believe, best carry out the objects to which I have referred.

Well, the first of these proposals is that this great property, with the resources for the attainment of its great objects in view, shall be presented to the Nation. We ask to present it to the Nation, for whose benefit the Institute came into existence. We think it should be presented so that the Governing Body shall be able to pass over to the representatives of the Nation—the Government—this great property, valuable, unburdened, full of power and utility, for the purpose of carrying out the objects for which the Imperial Institute was founded.

But I may state to you that, in our opinion, it should not be an unconditional gift. There are attached certain trusts, which are in the nature of so-called charitable trusts. This Institute was founded for the purpose of specially benefiting the Colonies and Dependencies. These benefits must still be retained. It must be a term of the transfer that the Colonial and Indian interests shall be protected fully and never lost sight of in carrying out the change.

We now ask you to reflect seriously upon what can be said in respect of these propositions. We should not have ventured to resolve them into their present shape if we had not had one object in view—that greater utility should be given to the Institute, and that the Colonies and Dependencies of the Empire should receive more benefit than they reap at present. Taking into consideration all that exists, we believe that by adopting the proposals I have suggested to you, great benefit will be conferred on the Nation, in the interests of its trade and commerce, and in the spread of its commercial prosperity, by making this great agency receive within itself new life and power by conferring upon it Government responsibility.

I hope that if your resolution should be that it is desirable to take this course, that the Government will be disposed to consider the offer in a generous spirit. I know that it has been found necessary to take you somewhat by surprise, but it seems, so far as I can judge, that it will be necessary, before this transfer can be made, that a private bill should be passed through Parliament, and when that takes place, any exceptions which might be made to the proposal will be fully considered.

I do not know whether I need mention individuals, but upon receiving intimation from two of our body on whose judgment I place much value—Sir Henry Fowler and Lord Rothschild—that they could not attend this meeting, I thought it advisable to tell them the nature of the proposition which would be made, and I have received from both of them letters very strongly approving of the suggested course.

There only remains for me to say one word more. I hope you will forgive me if I refer to myself. I was one of those, who in a country-house in Scotland in 1886, took part in resolving the idea of an Imperial Institute. During the lifetime of the late Lord Herschell I gave such assistance as I could to the Governing Body. Since his death I have taken the present responsibility which has been thrown upon me, and it is a responsibility I could never have borne but for the generous and devoted assistance of my friend Sir Frederick Abel. Occupying the position on the Governing Body which we do, we naturally entertain feelings almost of affection towards the Imperial Institute, and I say, speaking for both of us, that, having given our very best consideration to this matter, and to the future of the Institute, we feel that in loyalty to this body, we are entitled to commend, as we do commend, this proposition to your Royal Highness and to the Governing Body.

Having been invited by His Royal Highness the President to address the Governors, the LORD CHANCELLOR said:—It will be impossible for me to address you, Sir, on the present occasion without giving voice to the sentiment, which I am sure we all feel, that it is a matter of hearty congratulation that we should find you at our head on this occasion, after you have given the most conclusive proof of your interest in all that binds the Empire together, by the long voyage you have taken, and by the labours you have gone through, and it is with the heartiest congratulations of everyone here that we welcome you back to these shores, which your position and your personal qualifications have done so much to adorn.

With reference to the Resolution which has been placed in my hands, I really do not think, after the statement which has been made to you by my noble friend, that it is necessary for me to go into the particulars whereby that Resolution should be commended. I suppose

everyone who is acquainted with business, and has had anything to do with any kind of organisation among mankind, must know that if there is one thing more calculated to render effort unsuccessful, it is the squandering of forces of those who are interested in different and competing bodies. And it appears to me that this is the position with reference to the Board of Trade and the Imperial Institute. It is impossible not to see that, in order to carry matters to a successful issue, there must be unity of design and unity of administration; otherwise, as I have said, you squander your forces in vain efforts of a useless competition between two persons in the same field, working at the same objects. That difficulty must be got over; and I must say for myself, after giving full consideration to this matter, that I have come to the conclusion that, in order that the real objects of this Institute should be fulfilled, it is absolutely necessary that the first place should be taken by either the Board of Trade or the Imperial Institute. It is impossible not to see that the powers of the Government, and their mode of administration, must be the one to prevail.

I now beg to move the following Resolution:—

“That this meeting of the Governing Body of the Imperial Institute, believing that its objects and purposes will be best carried out by the Institute and its property being transferred to the Nation, hereby approves of such transfer.”

SIR DAVID TENNANT, in seconding the Resolution, said:—When we look back upon the past history of the Institute, and recall the strenuous efforts to create a success, which has been so long delayed, we must feel sure that the further continuance of the Institute, on its present lines under the existing circumstances, will not achieve that advance which we are all so desirous of obtaining. Division is always to be deprecated. Under these circumstances, I think we should do wisely to adopt the Resolution, and I am sure the Colonies will heartily respond to the suggestions made,—that there should be one undivided authority; that that authority should be the Government; and that the Government should bring to its aid such counsel as they deem advisable for the furtherance of the objects of the Institute, and to secure for it a permanence which otherwise it might fail to obtain.

I, therefore, most heartily second the Resolution, and feel sure that it will receive the unanimous support of all the Governing Body, who take a deep interest in the welfare of this country, of its Colonies, and the progress of trade.

SIR WALTER PEACE said:—I think myself that this proposal, which has been sprung upon us somewhat as a surprise, will depend, for what measure of approval it will receive in the country, upon the answer which will be made as to how His Majesty's Government will utilize the Institute after the premises have been transferred to it. Whether it is to be made a vitalising influence, which will accomplish the objects which we all desire, or whether the transfer to the Government is of something which we could do nothing with, and will be made without our knowing what steps the Government would take to fulfil the objects and purposes for which the Institute was founded, I feel that the general opinion will be to desire that information.

MR. W. J. DAVIS (representing the Trades Union Congress of Great Britain) said:—I represent the working men of England, and although the Resolution was a great surprise to me, I entirely fall in with it. The Government manage their great Institutions so well that they are popular throughout this country. We have the assurance that this will not be an unconditional gift to the Nation, and I think that this answers the remarks of Sir Walter Peace. But if we found that the original objects and purposes of this great Institute were to be perverted, there would of course be considerable opposition to the proposal. The question of overlapping is a very serious one in all great institutions; we see instances of it in the educational system and in the Local Government Bodies. I, therefore, think that the case is well made out. We all appreciate the difference between times of adversity and times of prosperity: now is a time of prosperity for the Institute, and I feel that we should take the opportunity of presenting it to the Nation.

LORD JAMES said:—In reference to the remarks of Sir Walter Peace, I can assure Sir Walter that, so far as it lies within our power, his views shall be carried into effect. I pointed out in my statement that this is not to be an unconditional gift; we are not going to let the Government do what they like with the Institute; they will have to undertake to carry out the objects for which it was founded. The Representatives of India and the Colonies will have ample opportunity of considering the terms upon which the transfer will be made, and the full concurrence of the Governing Body will be sought after they have had full information.

SIR OWEN TUDOR BURNE said:—I should like to say a word, as one of those who have represented India upon the Governing Body of the Institute from the time of its birth. I think it is very satisfactory to learn that the proposed gift will not be made without certain conditions. Especially do I say this, because, among many who are here I represent a country which, after all, contributed a large proportion of the funds subscribed, and has been foremost in advancing the objects of the Institute—I refer to India. It is very satisfactory to learn that the Indian Authorities will be fully consulted in this matter, in regard to the handing over of the gift under certain conditions; and I hope that the Memorial character of the Institute will be maintained. That Institute was built with the concurrence of our late most gracious Sovereign as a Memorial of her Reign; and I trust that if we do hand it over to the Nation, this point will be kept in view from first to last.

The Resolution was then submitted to the meeting by the PRINCE OF WALES and carried unanimously.

LORD KELVIN said:—I have the honour to propose that the following members of the Governing Body, with power to add to their number, be appointed a Committee for the purpose of carrying the Resolution just passed into effect:—The Lord Chancellor, the Lord James of Hereford, the Lord Chief Justice, Sir Henry Fowler, Sir Robert Herbert, Sir Owen Tudor Burne, and Sir Frederick Abel.

The Hon. H. COPELAND said:—With reference to the Resolution proposed by Lord Kelvin, I have no objection whatever to offer to it, and have great pleasure in seconding it. I should like, however, to say one word with reference to the Resolution which has just been passed, and to ascertain whether it is intended to keep a Standing Committee in the interests of the Institute, so as to take care that the Government act up to what we consider to be the best policy in the interests of the objects of this Institute. It would be desirable to have a Standing Committee for that purpose, and such a Committee should be a little more representative than the one just announced by Lord Kelvin. I think that it should include at least one Representative of each of the great portions of the Empire—India, Canada, Australia, and of all the States who have helped to build up the Institute, so as to see that the Government are kept up to the mark. Governments often take matters in hand which afterwards, owing to something else more important turning up, are apt to get shelved, and such poor little matters as the Imperial Institute might get overlooked. Therefore it would be desirable to keep a representative Committee always in existence to look after the interests of the Institute.

LORD JAMES said:—We have placed in Resolution No. 2 the words “with power to add to their number,” which I trust will meet the point raised by Mr. Copeland.

After the PRINCE OF WALES had put to the Meeting the second Resolution, which was carried unanimously, he said:—Your Royal Highness, my Lords and Gentlemen, I only wish to say that, before the proposal had been submitted to you, I did not wish to offer any opinion, but now that it has been sanctioned by you, I should like to express my complete satisfaction with your decision, and I am sure that you will be glad to hear that the King entirely approves of the course to be adopted.

FINANCIAL AND COMMERCIAL RETROSPECT.

UNITED KINGDOM.—The Board of Trade returns for December were more satisfactory than they have been for several months. In comparison with the returns for December, 1900, which had the same number of working days, there was an improvement in the imports, which were valued at £46,770,097, of £323,435, or 0·7 per cent., while the exports of British and Irish produce, valued at £24,313,777, showed an increase of £701,805, or 2·9 per cent. The re-exports were worth £5,912,247, against £5,087,220 in the preceding December. In the imports the increase was pretty generally spread over every class of article except living animals, duty-free articles of food and drink, manufactured articles and metals. Cattle fell off by about 18 per cent. both in numbers and in value, but sheep rose 66 per cent. in the former respect and 68·5 in the latter. Bacon, beef, butter, cheese, and mutton all increased both in value and in quantity. The shipments of wheat from Argentina fell considerably, and, as a result, in spite of larger supplies from the United States, the total arriving in this country was 3·2 per cent. less than in the preceding December, while a fall in price reduced its value by 7·8 per cent. Wheat flour, however, increased in amount by 47,000 cwt., though its value was slightly less. Barley rose 38·3 per cent. in quantity and 35·2 in value, and in oats, owing to larger supplies from Russia, there was a rise of 51·2 per cent. in quantity and of 82·4 in value. In Indian corn, on the other hand, there was a fall of over 2,000,000 cwt., while the value was reduced by nearly £600,000 (28·6 per cent.). In refined sugar there was an increase of 26 per cent. in quantity and 9·7 in value, while the quantity was 30·2 per cent. and the value 6·4 per cent. better in raw sugar. In tea there was a slight increase in quantity, but the value remained stationary; while in coffee an increase of 83·6 per cent. in amount only brought 26·2 per cent. improvement in value. Wine increased 10·3 per cent. in quantity and 8·6 in value. In raw materials for textile manufactures, the weight of the cotton imports increased by 445,676 cwt. (18·8 per cent.), but the increase in value was only £93,383 (1·3 per cent.); the contribution of the United States was greater, but those of Egypt and India less. Flax, hemp and jute, all increased in quantity and to a greater or less extent in value, but raw silk fell off 48·2 per cent. in amount and 44·9 per cent. in value. In the exports, coal was less by only 173,024 tons (4·7 per cent.), but its value was reduced by £736,021 (24·5 per cent.). Iron and steel were 3·6 per cent. higher in quantity, but 9·9 less in value. In spite of an increase in locomotives, due to larger shipments to South Africa, machinery was worth nearly a quarter of a million less. In new ships sold to foreigners, there was, however, the large increase of £1,093,525. Cotton manufactures showed a satisfactory increase in amount (22·9 per cent.), as a result of larger shipments to China, Japan, India, and British South Africa, but the total increase, which amounted to 93,608,700 yards, was not accompanied by a proportionate increase in value, which was only greater by £609,536 or 13·5 per cent. Other cotton manufactures, as well as cotton yarn, showed decreases in value, though the latter rose 15·7 per cent. in quantity. In wool there was a slight increase of quantity, though the value was less, but woollen and worsted yarns and tissues were all reduced in quantity and to a still larger extent in value. Chemical manures were less, though the fall in the value was not so large as in the quantity, but soda-compounds improved 19·5 per cent. in amount and 14·2 per cent. in value. As will be seen from the following table the total volume of trade in 1901 was 0·7 per cent. less than in the preceding year:—

—	1900.	1901.	Increase or Decrease.
Imports	£ 523,075,163	£ 522,238,986	- 836,177 = 0·15 %
Exports — British and Irish produce	291,191,996	280,498,889	- 10,693,107 = 3·6 %
Exports — Foreign and Colonial merchandise	63,181,758	67,846,843	+ 4,665,085 = 7·3 %
Volume of Trade	877,448,917	870,584,718	- 6,864,199 = 0·7 %

An issue of £2,000,000 Local Loans Three per cent. Stock, resulted in applications for nearly 13 millions sterling, at prices varying from £99 (the minimum) to £100. 10s. Tenders at £100. 3s. received about 35 per cent. of the amounts applied for; those above allotment in full. The average price obtained was £100. 3s. 9d. A considerable amount of the stock is believed to have been taken on behalf of the Post Office Savings Bank.

According to Lloyd's ship-building returns, the number of vessels (excluding warships) launched during 1901 in the United Kingdom was 639, with a gross tonnage of 1,524,739; of these only 48 (tonnage 23,661 tons) were sailing ships. Of the steamers no less than 140 were over 4,000 tons (in 1892 only 37 reached that tonnage), and eight exceeded 10,000 tons. The total output of the world in 1901 (excluding warships) appears to have been about 2,617,000 tons, while the ships removed by being wrecked or broken up amounted to 746,000 tons. Hence the net increase of the world's mercantile tonnage was 1,871,000 tons. The number of warships launched in the United Kingdom was 41, with a total displacement of 211,969 tons, and it may be added that the amount of warship tonnage (330,000 tons) now under construction in this country is smaller than it has been since December, 1897. In other countries 85 war-vessels, of 454,000 tons displacement, were built in the course of the year. The largest output of tonnage in this country

was from Newcastle (292,989 tons); Glasgow followed with 274,606 tons, Sunderland with 268,069, Greenock with 163,816, Middlesbrough with 161,058, Hartlepool with 150,607, and Belfast with 149,705. As regards warship tonnage, Glasgow led with 60,200 tons, London was second with 30,815, and Belfast third with 26,700.

COLONIES.—The gold output from the Rand in December amounted to 52,897 oz. of fine gold, a very considerable increase over the figure for November, which was only 39,075 oz. For the eight months since May, when the first mines were allowed to resume work, the total was 238,991 oz., and much better results may be expected in the near future, as the number of stamps at work is being increased every week. The yield from Rhodesia is slowly increasing; in December it was 15,174 oz., against 14,502 oz. in November, and 9,463 oz. in December, 1900. In West Australia the gold exported and received at the Perth Mint, amounted to 177,165 oz., valued at £682,086, an increase of 27,834 oz., as compared with December, 1900. In last year West Australia produced seven tons more gold than in 1899, the figure for which, 1,643,973 oz., was hitherto the largest recorded. Fourteen years ago the yield was only 302 oz.. In New South Wales the yield for December was 18,094 oz., valued at £51,704, against 36,248 oz., valued at £125,001 in the same month of 1900, while the total for 1901, amounting to 270,724 oz., and worth £921,282, is considerably behind that of the preceding year, viz.: 345,650 oz., valued at £1,194,521. In Queensland the output for December was 73,300 oz., and for the year 816,600 oz. Canada reports a highly prosperous year. Her exports were worth \$196,000,000, or twice what they were valued at ten years ago, while her imports have grown in the same period from \$119,000,000 to \$190,000,000. In Australia the revenue of New South Wales for the last half of the year amounted to £5,102,893, showing a decrease of £2,033. South Australia fared worse, for there was a decrease of £224,193, the total being £1,085,752. On the other hand Victoria's revenue rose by £213,971 to £3,943,076. In Tasmania there was a falling off for the whole year of about £100,000. In New Zealand, for the nine months ending on December 31st, the revenue reached a total of £4,211,612, a gain of £181,000, as compared with the return for the same period of the preceding year. The Customs revenue at £1,606,353 was £35,085 better, the Land Tax yielded £56,383 more, the total being £296,509, while an increase of £103,975 brought the railway revenue up to £1,301,779.

Two Colonial loans were floated during the month. Natal issued £1,945,000 Three per cent. Consolidated Stock at 93, and the Cape offered £2,608,300 Three-and-a-Half per cent. Stock on the tender system, the minimum being fixed at 102. The average price obtained was £102. 3s. 6d., and tenders at £102. 2s. received about 28 per cent. of the amounts applied for, those above obtaining allotment in full.

The following table shows the variations which have occurred in certain Colonial Government securities during the past three months:—

	28th Nov.	30th Dec.	28th Jan.
Canada 3 per cent.	101 $\frac{1}{4}$ —101 $\frac{3}{4}$	101 $\frac{1}{4}$ —101 $\frac{3}{4}$	101 $\frac{1}{4}$ —101 $\frac{3}{4}$
Cape 3 per cent.	93 $\frac{1}{2}$ —94 $\frac{1}{2}$	95—95 $\frac{1}{2}$	94—94 $\frac{1}{2}$
Natal 3 per cent.	93 $\frac{1}{2}$ —94 $\frac{1}{2}$	94—95	93 $\frac{1}{2}$ —94 $\frac{1}{2}$
New S. Wales 3 per cent.	94—94 $\frac{1}{2}$	95 $\frac{1}{2}$ —96	95 $\frac{1}{2}$ —96 $\frac{1}{4}$
New Zealand 3 per cent.	93 $\frac{1}{2}$ —94 $\frac{1}{4}$	94 $\frac{1}{2}$ —95	94 $\frac{1}{2}$ —95
Queensland, 3 per cent.	93—93 $\frac{1}{2}$	93 $\frac{1}{2}$ —94 $\frac{1}{4}$	93 $\frac{1}{2}$ —94 $\frac{1}{4}$
South Australia 3 per cent.	92 $\frac{3}{4}$ —93 $\frac{1}{4}$	93 $\frac{1}{4}$ —93 $\frac{3}{4}$	93—93 $\frac{1}{2}$
Tasmania 3 $\frac{1}{2}$ per cent.	103 $\frac{1}{2}$ —104 $\frac{1}{2}$	103 $\frac{1}{2}$ —104 $\frac{1}{2}$	103 $\frac{1}{2}$ —104 $\frac{1}{2}$
Victoria 3 per cent.	95 $\frac{1}{4}$ —96 $\frac{1}{4}$	96 $\frac{1}{4}$ —96 $\frac{3}{4}$	96 $\frac{1}{2}$ —97
West Australia 3 per cent. (May—Nov.)	91 $\frac{1}{2}$ —92 $\frac{1}{2}$	92 $\frac{1}{2}$ —93 $\frac{1}{2}$	92 $\frac{1}{2}$ —93 $\frac{1}{2}$

INDIA.—The variations which have occurred in the securities of seven leading Indian railway companies are shown below:—

	29th Nov.	30th Dec.	29th Jan.
Bengal and North Western	129—133	127—131	130—134
Bengal-Nagpur Gua. 4 per cent.	105—109	106—110	105—109
Bombay, Baroda & Cent. India	170—175	171—176	155—165
Indian Midland 4 per cent.	106—110	106—110	104—108
Madras Grntd. 5 per cent.	138—143	134—138	136—140
South Indian 4 $\frac{1}{2}$ per cent. Deb.	138—143	136—141	137—142
Southern Mahratta 3 $\frac{1}{2}$ per cent.	107—111	107—111	106—109

FOREIGN COUNTRIES.—In the Russian Budget for 1902, the total expenditure is put down at 1,946,571,976 roubles, of which 1,775,913,481 roubles represent ordinary expenditure, and 170,658,495 roubles extraordinary. The revenue is estimated at 1,802,584,482 roubles—1,800,784,482 ordinary and 1,800,000 extraordinary—so that there is a deficit of 143,987,494 roubles. These figures, as compared with the Budget of 1901, show an increase in ordinary expenditure of 119,260,925 roubles, and in ordinary revenue of 70,688,476 roubles. A large part of this enlarged expenditure is accounted for by the estimates of the Ministry of Ways of Communication, which is spending 52 million roubles more than in 1901. The construction of new railway lines, together with the development of the traffic and the improvement of the equipment on those that already exist, necessitates a great increase in ordinary expenditure; and, moreover, the present Budget has, for the first time, to make provision for the working by the State of the Moscow-Yaroslav-Archangel line. The remainder of the increased expenditure is made up of an increased sum of 30 million roubles, required by the Ministry of Finance (though 12 millions of that is in connection with the spirit monopoly and is balanced by a corresponding increase in revenue), and by various small amounts required in other departments. The increase in the revenue is expected, as to 35 million roubles, from larger receipts from the railways; other sources of revenue which are calculated to yield more money are: Customs (8,800,000 roubles), Imperial forests (8,200,000 roubles), sugar trade (7 million roubles), taxes on commerce and industry (3,400,000 roubles), and post office (2,400,000 roubles). On the other hand, a decrease of 10 million roubles is anticipated in connection with some other departments. Of the extraordinary expenditure the greater part is also allocated to railway construction; thus nearly 16 million roubles are to be expended on the

Siberian railway in re-construction and other ways, while 150 millions are to be devoted to making other lines within the empire—for example, the Orenburg-Tashkent railway. The 144 million roubles necessary to balance this year's Budget will, as usual, be drawn from the ever-ready free resources of the Imperial Treasury. These, at the beginning of last year, amounted to nearly 105 million roubles, and in the course of the year they were augmented by various sums amounting to about 116 million roubles, as well as by the 127 millions raised by the four per cent. loan of last spring. On the other hand, they have been depleted by the sum of 106 millions, spent on the military operations in the Far East, in alleviating the distress caused by the famine, and in other ways. At the present time they are considered to amount to about 240 million roubles.

In the French revenue for last year there was a deficit of 167,000,000 francs as compared with 1900. Beer, wine, cider, perry and mead account for 126,000,000f., Customs duties for 41,000,000f., beet-root sugar for 23,000,000f., and death and transfer duties for 22,000,000f. On the other hand, there were increases of 40,000,000f. from spirits, 3,000,000f. from the tax on coupons and dividends, 5,000,000f. from the stamp duty on bonds, and 5,000,000f. from the stamp duty on mortgages. The French railway receipts for last year show a decline of 17,000,000f. in the Northern, 15,000,000f. in the Paris, Lyons and Mediterranean, 11,000,000f. in the Eastern, 8,000,000f. in the Western, and 4,000,000f. in the Orleans lines.

The German imports last year amounted to 44,304,857 tons (1,000 kilogrammes = 1 ton) against 44,911,799 in 1900, the value falling 75,975 marks. The exports increased by 271,241 tons to 2,909,648 tons, their value rising 6,806 marks. A new German Imperial 3 per cent. loan for 115 million marks, and a Prussian one for 185 million marks, were placed on the market last month. The subscriptions to the former amounted to something like 7,000 million marks.

Our usual table of exchanges follows:—

	28th Nov.	30th Dec.	29th Jan.
Paris, cheques	25f. 16c.	25f. 14c.	25f. 12 $\frac{1}{2}$ c.
Berlin, sight	20m. 43 $\frac{1}{2}$ pf.	20m. 39 $\frac{1}{2}$ pf.	20m. 44 $\frac{1}{4}$ pf.
Vienna, sight	23kr. 94	23kr. 91 $\frac{1}{2}$	23kr. 93 $\frac{1}{4}$
Amsterdam, sight	12fl. 10 $\frac{3}{4}$	12fl. 10 $\frac{1}{4}$	12fl. 13 $\frac{1}{2}$
Madrid, sight	35ps. 80	34ps.	33ps. 80
Lisbon, sight	38 $\frac{1}{2}$ d.	39d.	40d.
St. Petersburg, 3 months	93r. 85	93r. 65	93r. 90
Bombay, T.T.	rs. 3 $\frac{3}{8}$ d.	rs. 4d.	rs. 4 $\frac{3}{8}$ d.
Calcutta, T.T.	rs. 3 $\frac{3}{8}$ d.	rs. 4d.	rs. 4 $\frac{1}{8}$ d.
Hong Kong, T.T.	rs. 9 $\frac{3}{4}$ d.	rs. 10 $\frac{1}{4}$ d.	rs. 10d.
Shanghai, T.T.	2s. 5d.	2s. 6 $\frac{1}{4}$ d.	2s. 6 $\frac{1}{2}$ d.

AGRICULTURAL RETROSPECT.

UNITED KINGDOM.—Dull and occasionally rainy weather, with short periods of frost, was experienced during January, and the autumn-sown crops are in the best possible condition. Grass lands presented an unusually luxuriant appearance for the first month of the year, cattle enjoying several days of green pasture in the open fields. Good progress has been made with tillage work, and in some places sowings of oats and barley have already begun. During 1901 the value of the imports into the United Kingdom of articles of food and drink and living animals for food amounted to £219,945,200, a proportion of 42 per cent. of the total imports of all kinds, and £5,002,264 more than the corresponding amount in the previous year. The value of living animals imported for food was £9,400,033, or £222,286 less than in 1900. Of cattle, North America sent us 98 per cent. of our total supplies, the United States supplying £7,293,942 worth, and Canada £1,497,472 worth. No cattle were received from the Argentine during 1901, our ports being closed against live stock from that country owing to the presence of foot and mouth disease in the valley of the Plate. The trade thus displaced has been acquired by the United States. Our imports of live sheep have substantially decreased during the last three years; £942,891 was the value of the imports in 1899, £610,125 in 1900 and £582,969 in 1901. This decrease, however, is more than compensated for in the increase of dead meat imported. The value of our imports of all dead meat has advanced from £36,149,891 in 1900 to £39,987,806 last year. Of our disbursements for fresh beef the United States received the largest share, namely, £6,761,587 out of £8,906,839. Australia received £378,701 and New Zealand £366,595. Our payments for imported fresh mutton in 1901 amounted to £6,597,780, of which New Zealand received £2,949,441 and Australia £952,511, or a total for Australasia of £3,901,952, as compared with £3,380,241 in 1900. To Argentina went the sum of £1,950,599, which is an increase of £261,521. Our bill for imported bacon went up last year by £1,816,207 to a total of £13,590,176. Out of this total £9,255,851 went to the United States, £3,234,456 to Denmark, and £921,509 to Canada. We continue to buy foreign eggs in ever-increasing numbers, and last year we paid £5,495,776 on that account. Russia, which became in 1899 our chief source of eggs, has maintained that position, Denmark, Germany, Belgium and France following in order. Canada sent us £255,766 worth of eggs. A decline is recorded, both in quantity and in value, in our imports of cheese, for which we paid last year £6,227,277 or £610,606 less than in 1900. The chief disbursements under the head of cheese were £3,697,780 to Canada, £1,274,061 to the United States, and £747,035 to Holland. Our imports of butter rose in quantity from 3,378,516 cwt. in 1900 to 3,702,810 cwt. in 1901, and in value from £17,450,435 to £19,297,005, the latter showing an increase of £1,846,570. A falling-off took place last year in our imports of butter from Victoria and

New South Wales, those States, as well as New Zealand, having sent considerable quantities of their output to South Africa. Canada has recovered the position amongst our sources of butter which the bad Canadian dairy season of 1900 altered, and the sum paid by us to the Dominion on this score was £1,008,002 in 1901. The first place in the English butter market was held last year by Denmark, which supplied £8,950,497 worth. France came second with £1,704,128, Russia and Holland very close up in the third and fourth places, with Canada, as above mentioned, fifth. With regard to our imports of wheat grain it is interesting to note that Australia and New Zealand are receiving an increased share of our vast expenditure on that commodity, our disbursements to those Colonies amounting last year to £2,287,507, whilst Canada received £2,216,049 for wheat and £628,611 for flour.

COLONIES.—The Imperial Department of Agriculture for the WEST INDIES was only formed a little over three years ago, but in that short period a great deal of time has been devoted to investigating the improvement of sugar canes. It is a curious fact that, although the sugar cane has been cultivated in tropical countries for centuries, it was only about a dozen years ago that the discovery was made that they produced seeds, and that the plants could be grown from these seeds—the universal mode of propagation having been by means of slips. This knowledge of the existence of seeds has greatly simplified the question of developing better and more fruitful canes, and the authorities are doing their best to select from amongst the seedlings particular varieties to suit the different kinds of soil and climatic conditions. A year ago (March, 1901, page 76) we gave a short account of the remarkable results of the experiments conducted in Barbados by Professor d'Albuquerque and Mr. Bovell during the 1900 season, when it was shown that the best cane was the seedling B 147, followed by B 208, the standard cane favoured by the planters, and known as White Transparent, being eighth in order of merit. Last season the experiments were continued on a similar plan, the competing plants being grown in ordinary plantations, not in botanic gardens, and every care being taken to treat all equally. Unfortunately, the weather was very unfavourable, and the general result was an early crop of canes; the growth of which had been checked, and which had been brought to premature ripeness; consequently the purity of the cane juice generally was much below the average, and the tonnage of canes, and richness and purity of juice, were markedly diminished in such late-growing varieties as B 147. It is not surprising then, that the results do not agree with those of the previous year, the first place being now taken by B 208, which is described as the best all-round cane on account of its ready germination, the general absence of disease, the yield of sugar, the great richness and purity of its juice, and the satisfactory results obtained in both black and red soils, plants, and ratoons. Its juice purity was high, and the yield of sucrose 7,330 lb. per acre. White Transparent occupied second place, with fair juice purity, and 7,176 lb. of sucrose per acre, but the percentage of rotten canes was rather high. B 147 came third, with low purity of juice, and 6,787 lb. of sucrose per acre. Several varieties gave such poor results that, after weeding them out, it is proposed to experiment this year with white transparent Jamaica cane, the Sealy seedling, B 147 and B 208, and with such other promising new canes and seedlings as may be introduced. While these experiments were being carried out at Barbados, similar ones were being conducted at ANTIGUA and ST. KITTS, all tending to prove the absolute necessity of discovering the best cane to suit local conditions of soil, the islands varying a good deal in character. At Antigua there were 14 varieties of canes and seedlings in competition, there being 12 plots of each variety. D 95 secured first place, with 8,158 lb. of sucrose per acre, Mt. Blanc coming second with 7,256 lb., and Naga B third with 7,134 lb. White Transparent was seventh on the list with 6,856 lb., and B 147 only 12th with 6,050 lb. Turning to the St. Kitts results, where 20 varieties were competing, we find that—as in Barbados—B 208 is at the top of the list, with 9,817 lb. of sucrose per acre, while Naga B comes next with 8,956 lb., followed by B 147 in the third place with 8,874 lb. On the other hand, Mt. Blanc declines to the 11th place with 7,631 lb., and White Transparent is still further down, occupying the 16th place with 6,207 lb. In both islands it will be seen that the yield of the standard cane is far below that of the best new seedlings. From these experiments it is hoped to secure several kinds of canes, hitherto untried in St. Kitts, which will give better yields than those at present under cultivation. Full details of the experiments and the results have just been published by the Department of Agriculture. The Imperial Commissioner urges the planter carefully to study the facts contained in these publications, and not to embark on the cultivation of new canes until he has fully satisfied himself that they are exactly suited to the circumstances of his district.

The results of the work of last season in the agricultural, live stock and dairying industries in MANITOBA have been given in a bulletin issued by the Provincial Department of Agriculture and Immigration at Winnipeg. With regard to the wheat crop the bulletin says that the average yield for the province is now given as 25.1 bushels per acre, and a total crop of 50,502,085 bushels. The acreage in crop was 2,011,835. The eastern district suffered most from too heavy straw, and heads only partly filled. The yield increased westward to the boundary of the province, and was particularly heavy in the north-western district. In the Rapid city district and westward, and along the line of the Manitoba and North Western railway, a wonderful crop, averaging 30 bushels to the acre, was garnered. "This fact, with the advent of the new railroad from Forrest westward, makes that district a most desirable place for settlement and investment." The oat crop, although on the whole a good crop, was not up to expectations in many districts. The total yield for the province was 27,796,588 bushels from an area sown of 689,951 acres, or 40.3 bushels per acre. The barley crop is generally reported as one of the best ever grown in the province; heavy yield and fine, plump berry. The province was specially free from any disastrous hailstorms. The total yield was 6,536,155 bushels from 191,009 acres in crop, or 34.2 bushels per acre. The season of 1901 was also the most successful in the history of the dairy industry of Manitoba. The increase of dairy butter production was 31 per cent. over that of the previous year, and the

average price having remained about the same, a corresponding increase appears in the value. The output of creamery butter made a phenomenal stride, an increase of 96 per cent. over last year being shown. The average price was about 1½ cent lower than in the previous season. The total production of dairy butter was 2,748,090 pounds, of the value of 395,540 dollars, or 14.04c. per pound; of creamery butter, 2,460,650 pounds, of the value of 442,424 dollars, or 17.98c. per pound. There was very little increase in the output of cheese, but the quality and make of cheese has greatly improved and fewer complaints were received. The total production in the province was 1,039,392 pounds, valued at 88,348 dollars, or 8.5c. per pound. The number of live stock includes 142,080 horses, 263,168 cattle, and 94,680 pigs.

INDIA.—The first forecast of the cotton crop in the North-Western Provinces and Oudh reports that a very large area—the largest since 1894—has been devoted to the cultivation of cotton this year. The apprehensions of serious injury from the drought of September were not realised. Where there was irrigation, the crop seems to have altogether escaped injury. The condition of the present crop is better than the plentiful crop of 1900–01 at the corresponding period, the average condition for the province being represented by the figure 86, 100 representing a normal crop. The estimated out-turn amounts to 266,430 bales of 400 lb. each, a yield of 73 lb. per acre, as compared with 68 lb. in the previous year. In the Central Provinces the area under cotton is estimated at 990,042 acres, or slightly below last year's area, but 49 per cent. above the decennial average. The out-turn is estimated at 152,620 bales of 400 lb. each, as compared with 184,087, the out-turn of the preceding year.

His Excellency the Governor of CEYLON, in his address at the opening of the Legislative Council, referred to the progress made in the cultivation of minor agricultural products. Cacao is doing well, and on most estates the canker has been largely eradicated. Cocoanuts, cinnamon, cardamons, and other smaller products, have been in a prosperous condition during the year. Of new products, rubber claims the first place. Exports of appreciable quantities have commenced, and the prices obtained have been most satisfactory. The latest market report contains the entry: "Best Para, 3s. 9d.; Ceylon, fine, Para sort, 4s. 1½d. per lb." This cultivation may now be considered established in the wet low-country districts. Camphor has continued to attract attention, and bids fair to prove a paying minor product for many parts of the south-west and the hills. Samples prepared from trees grown in the Botanic Gardens have lately been valued at 126s. per cwt. The yield of camphor from clippings of leaves and young twigs is about 1.2 per cent., and the preparation is cheap, so that in places where 16,000 lb. of clippings can be obtained from an acre in a year, there is little doubt that it will pay well. Of other minor or new products, tobacco continues to extend, also vanilla, pepper, cinchona, and tapioca; the roots of the last-named are, however, only used as yams, and not for the preparation of tapioca. Citronella oil is in a very depressed state, owing to over-production and to low prices, with new competition in unadulterated oil from Java.

FOREIGN COUNTRIES.—The report of the Committee on Food Preservatives contains an interesting account of a visit paid to DENMARK by Dr. Bulstrode and Mr. Huddart in connection with the business of the Committee. It is observed that Denmark is a country of co-operative dairy societies. The country has laid itself out to perfect its butter manufacture as a national industry, and local exhibitions held all over the State in furtherance of the butter trade are aided by the Government. No State aid is, however, afforded to small farmers in need of capital for outlay on their business, but money can be borrowed at a low rate of interest from local banks, some of which belong to large co-operative societies. The central creameries draw milk from an average radius of six miles, and the farmers (who are members of the society to whose creamery they send their produce) are paid according to the quantity and the quality of the milk sent in. Government inspectors are employed to take samples of separated milk on its way from the creamery to the farm for cattle food, in order to ascertain that the law, which requires that all milk used as food for cattle shall be duly pasteurised, has been carried out. The milk cattle are mostly of the red Danish breed, but in Jutland the local breed is well represented. They are tethered in the field by chains some 12 feet long. The cows are moved seven times a day gradually from one side of the field to the other; milking is performed at 4 a.m. and 4 p.m. The tails of the cows are cut in winter for cleanliness, and the coats of the cows are brushed twice a day. Each milker washes her hands before beginning to milk, and rinses them before milking each cow. She milks from eighteen to twenty cows, the milk being at once screened. The milk is again screened before passing over an 18-coil cooler, and is then placed in an ice-water tank till despatched. The milk is weighed before being sent off, and the cans are sealed. A farm at Sofiendal and the Hasley co-operative dairy were visited as being typical of the industry. One of the cow-houses at Sofiendal served for 112 cows, the heads of the cattle in each double row being four feet apart. The house was 45 feet wide, and each of its eight sections was 15 feet long and 12 feet high, sufficing for 14 cows, and giving each of them 580 cubic feet of air space. There were seven doors in the stable, and fifteen windows, all opening in part. The stable was quite in the open; floor, ceiling and walls are white-washed twice a year. Every two cows have one water-trough, which automatically fills but never over-flows. This is regarded as a safeguard against tuberculosis, such as would not be procured by a water supply common to the whole herd. In the Hasley Co-operative Dairy the milk of 1,200 cows is dealt with daily. The water supply is from a well sunk 62 feet into the chalk. No ice is used, cooling being effected by cold water only. All the milk on receipt passes through a strainer fixed over the weighing machine, and also through a centrifugal separator, each separator dealing with 3,600 lb. of milk per hour. The milk is then warmed to 40 deg. C. (104 deg. F.), the cream and the skimmed milk running by separate channels to different pasteurising plant. After pasteurising the cream is cooled down to 10–12 deg. C. (50–54 deg. F.) by means of a cold-water coil-cooler. The cream is again heated to 40 deg. C., and the butter starter, procured from the Copenhagen laboratory, is introduced. The cream then stands till next morning, when it is churned for half-an-hour. Each churn makes 180–200 lb. of butter in half-an-hour.

LABOUR RETROSPECT.

UNITED KINGDOM.—The preliminary figures published in the *Labour Gazette* testify to the check in industrial activity which, after continuous prosperity for five years, occurred at the beginning of 1901. The net effect of all the changes in wages recorded last year was a fall amounting on an average to 1s. 9d. per head of the 901,820 people affected. The decline was, however, entirely confined to the mining and metal trades; in fact, all the other trades showed a slight increase. It is reported with satisfaction that, in spite of all decreases, wages on the whole are higher than they were five years ago. The mining industry of Scotland showed the heaviest decrease of all; Northumberland and Durham yielded a net decrease of 22½ and 25 per cent. respectively, and South Wales 7½ per cent. The greatest increase took place in the building trade, where 36,162 workmen received an increase of 1s. 3¼d. per head per week. As to changes in the hours of labour, the net result showed a decrease of 2.09 hours per week in the working hours of the 24,749 workpeople affected. It should be remembered that the workmen's Saturday measure did not come into operation until the first Saturday of the present year. Regarding trade disputes in 1901, it appears that the number, both of disputes and of workpeople concerned in them, was less than in any of the years 1893–1900. However, the aggregate duration of the disputes was greater in 1901 than in either of the two preceding years, though considerably below the average of the years 1893–1900. Out of the 624 disputes which occurred, no less than 410, or about two-thirds of the whole, occurred in the mining, building, and metal trades, and, out of the grand total of 175,000 workpeople affected, 110,000 belonged to the mining industry. The number of days lost by miners through strikes and lock-outs was 1,875,000 in 1901, as compared with about half-a-million in each of the two preceding years. The clothing trades lost more by disputes in 1901 than in 1900, but considerably less than the annual average loss in 1893–1900. The transport and fishing group of trades was much affected by the Grimsby fishing dispute, and the figures for these trades are considerably above the average for the previous eight years. Regarding the causes of the stoppages, it is found that no less than 392 out of a total of 624 arose out of questions of remuneration. In all years this is the main ground of contention, but it is a significant sign of the change in the condition of the labour market that there has been a great proportionate increase in the disputes arising out of demands by the employers for a reduction in wages. As to the result of strikes, about 27 per cent. issued in favour of the workmen, 33 per cent. in favour of the employers, and 36 per cent. were compromised. The great majority were settled by direct negotiation.

Mr. Alfred Mosely's scheme for a commission of enquiry regarding the methods of commercial and industrial education has been widened in its scope. On account of the attention drawn of late to the attitude of labour towards capital in this country, Mr. Mosely has decided to establish a sister commission to investigate this important question in the United States of America. There the relationship between workman and employer is on a better footing than is the case here or on the Continent. The staff are more directly interested in the out-turn of the works where they are employed; in many cases some form of profit-sharing exists. The men are encouraged to make suggestions, and are given free access to the heads if they have any grievance to state. As a result, they are inclined to associate their interests with those of their employers. Seldom is any objection heard to the introduction of labour-saving machinery. The second, or labour commission, will consist of some twenty or thirty members, some of them belonging to trade unions connected with our most important industries, others employers or representatives of employers, and Mr. Mosely's hope is that all, having seen in America the material benefits of intelligent co-operation between employers and employed, will return to England and spread the light among their fellows who have not had the opportunity of seeing and hearing for themselves. There is no doubt of the justice of the outspoken comment of *The Times* that, speaking generally, these commissions will find that things go better in America, because everybody minds his own business. Employers do their own protection against tyranny, and also do their own conciliation to avert battles with powerful organizations fully capable of maintaining the just rights of workmen. The State does its part in collecting information of public utility and in seeing that the principles of individual liberty are maintained. Employers, however, must understand that they, and no others, must deal with the general questions. No law can do them much good until they help themselves in a manner at once vigorous, clear-sighted and just.

COLONIES.—The Deputy Minister of the Interior of CANADA is on a visit to the United Kingdom, in order to give attention to the rearrangement of the emigration work in the interests of the Dominion. It is well known that at present for every British emigrant who goes to Canada, about five go to the United States; and yet there is a brisk emigration out of the United States into the farming districts of Western Canada. It is this territory that the Canadian Government are so desirous of opening up, and the Canadian Minister points out that the vast territories included in the province of Manitoba and the North-West, offer by far the best and largest agricultural land open to settlement in Canada, possibly in the world. The magnificent crops of wheat and other cereals during the year 1901, and for a number of years previously, leave no doubt whatever as to the capabilities of the country, and notwithstanding the fact that the whole area under cultivation is less than 3,000,000 acres—perhaps not more than 1 per cent. of the area of the

territories, including the new district of Athabasca—the returns will be about 110,000,000 bushels. This is the production of possibly not more than 50,000 or 60,000 farmers, many of whom have only within the last three or four years settled in the country, and consequently, have not had an opportunity of bringing under cultivation all the land belonging to them. People of the United States who consider their personal interests first, are beginning to understand and appreciate the advantage offered for settlement in Western Canada, and upwards of 50,000 have within three or four years removed from the United States to Western Canada to engage in farming. It is hoped that under an active propaganda, the British emigrant will understand and appreciate the advantages that are offered to him in a country where he will continue to be under British institutions, and at the same time, without question, make more material progress than he could possibly make in any other country in the world.

With reference to the land settlement scheme for the ORANGE RIVER Colony, services of experts have been secured to ascertain localities suitable for fruit-growing, tobacco cultivation, etc. It is reported that 80,000 morgen of land in the Ficksburg district are being purchased by the Government, in addition to the 45,000 morgen which have already been bought in the Thaba N'chu district. New railway lines, projected or completed, will assist in opening up this promising agricultural district. The idea was to split up the land into blocks, each of which forms five or six holdings, and enable settlers to establish small communities and villages. The Government are also buying large tracts of land in the conquered district for the same purpose. Eighty of these farms have been allotted, and numerous applications are constantly coming in for others. In NATAL the scarcity of labour in the building trades is causing serious difficulties at Pietermaritzburg. It is stated that the military are employing labour at high wages, and thus denuding the market. The Government have been approached with a view to the removal of the restrictions on immigration. From the TRANSVAAL comes news of good progress: new industrial and commercial enterprises are being promoted, and work at the mines is steadily increasing, now that the native labour difficulties are being overcome. Recruiting for the Rand in the Portuguese territory of Mozambique has resulted satisfactorily, and the immediate despatch of 30,000 natives is announced.

INDIA.—The latest cabled reports state that prospects have improved, especially in the North-West Provinces, and prices are generally stationary. In Punjab and Rajputana the outlook is less serious than was anticipated, distress developing very slowly. In Gujarat relief has been extending rapidly, numbers having increased, mainly on works in Panch Mahals. The numbers in receipt of relief total 208,000, distributed as follows:—Bombay, 121,000; Native States, 26,000; Baroda, 35,000; Mysore, 1,000; Rajputana, 12,000; Punjab, 3,000; Ajmer Merwana, 4,000; Central India, 6,000.

FOREIGN COUNTRIES.—The United States Consul, in a report on the textile industries of GERMANY, gives an interesting comparison between labour conditions in that country and here. The tendency is for large factories to rapidly absorb small ones. It is difficult to average the rate of wages, owing to the manifold varieties of production, the different values placed on skilled and unskilled labour, and the employment of women and children. For example, in Silesia, the average rate of wages per capita amounts to \$117.81 per annum. This includes an increase in wages of 20 per cent. since 1887. It must be remembered, however, that in case of sickness labourers receive medicine and hospital nursing free of charge at the hands of the State. This wage rate would not apply to central and southern Germany, where conditions are materially better. In the cotton-spinning branch, Germany labours under greater difficulties than does England, Belgium, or Switzerland. The two first-named countries are situated nearer the base of imported raw material, while Germany must transport these necessities by rail some distance inland, thus increasing the cost of production. Switzerland is able to take advantage of cheap water-power, which Germany does not possess to a like degree. England also enjoys a class of highly-skilled labour, which seldom changes occupation. In Germany, especially in cotton-spinning, the class of labour employed is not so efficient, owing to frequent changes of employment. The task of educating labour up to a high degree of efficiency is difficult, and many generations are necessary to achieve that result. The English cotton-spinners have attained such a degree of skill and intelligence that for the most part no supervision is necessary. In Germany the presence of a technical overseer is indispensable.

In BELGIUM, parliamentary measures are proposed in order to check Sunday labour. If the Bill about to be introduced becomes law, work on Sunday will be optional, and can no longer be obligatory. The change will be gradual as, although many trades will avail themselves of the new measure, Sunday labour has been common for so long that such a radical alteration in habits is not likely to be adopted at once. No attempt will be made to interfere with the freedom of contract between those who find the extra day's work to their mutual interest.

Serious labour disturbances have again occurred in SPAIN. The metal workers of Barcelona struck for a nine-hours' day, and were joined by malcontents from most of the factories and workshops in the district. Much rioting and violence took place, and the assistance of both the civil guard and the military was necessary. The masters offered to receive the men back on a ten-hours' day basis, but threatened, if the strike continued, to transfer their works to another country.

SCIENTIFIC AND TECHNICAL DEPARTMENT OF THE IMPERIAL INSTITUTE.

THE WHEAT SOILS OF ROTHAMSTED STUDIED AS REGARDS THEIR PHOSPHORIC ACID AND POTASH.

Of all the elements which exist combined in the soil, there are three which are by far the most potent in producing heavy crops; these are phosphorus, potassium and nitrogen. These elements exist in the soil, not free, but combined in the form of various compounds, the phosphorus being combined in various phosphates, all of which contain the oxide of phosphorus P_2O_5 , often called phosphoric acid, and the potassium being combined in silicates and other compounds which contain the oxide of potassium, often called potash. Consequently, in discussing the richness of a soil, it is usual to reckon how much phosphoric acid, P_2O_5 , and potash, K_2O , it contains, although these are really present combined with other substances.

By making analyses of the soil, the total quantity of phosphoric acid and the total quantity of potash in it are found; thus the soil in one of the plots contained 0.120 per cent. of phosphoric acid, equivalent to 3,111 lb. in an acre of soil to the depth of 9 inches; but as the agents by which the plant supplies itself with food from the soil are far less drastic in their action than those which the analyst employs, the older analyses of soils leave a great deal to be desired as guides to the value of a soil as a crop producer and as to its manurial requirements. In consequence of this, the attention of chemists for some time past has been directed to devising solvent solutions which should give the desired information, namely, how much food immediately available for the plant there is in a given soil, and Dr. Bernard Dyer has introduced the use of a solution of citric acid containing one part of the acid in one hundred parts of water, and has found it a satisfactory agent for the purpose.

The magnificent agricultural experiment station of the late Sir John Lawes at Rothamsted, with its record of crops and manures extending over fifty years, afforded unique material and data for studying soil in its relation to crops and manures by means of the new solvent. This has been done by Dr. Dyer, and the results are published in the *Philosophical Transactions of the Royal Society of London*, 1901, Vol. 194, page 235, under the title—"A Chemical Study of the Phosphoric Acid and Potash Contents of the Wheat Soils of Broadbalk Field, Rothamsted."

The experimental plots had grown wheat year after year, and had received various manures, the same plot being treated year by year with the same manure. On examining the tables of analyses in conjunction with the history of the plots, it appears that the determinations of the total amounts of phosphoric acid and potash throw far less light on what has been going on than the determination of the amounts of those substances dissolved out of the soil by the use of the one per cent. citric acid solution, although these latter are much smaller quantities; consequently, in what follows, only the citric acid values will be referred to.

PHOSPHORIC ACID RESULTS.

Some of the numerous results relating to phosphoric acid are condensed in the following table:—

SOIL SAMPLES TAKEN IN 1893.

Plot.	Annual manuring for 50 years (with only minor variations during earlier years).	Percentage of phosphoric acid (P_2O_5) in fine dry soil, 1st 9 inches, dissolved by 1 per cent. citric acid solution.	The phosphoric acid (P_2O_5) expressed as lb. per acre.	Proportional amounts of phosphoric acid.	Average yield per acre, 1889-94.	
					Wheat.	Straw.
3	Unmanured continuously.	0.0078	202	1	bushels.	cwt.
10A	Manured with nitrogen only, in the form of ammonium salts, since 1844.	0.0074	192		13	9
7	Complete manuring with mineral substances: phosphorus in the form of superphosphate, nitrogen as ammonium salts, potassium, sodium and magnesium sulphates.	0.0547	1418	7.2	35	33½
11	Manured with nitrogen and phosphorus only, in the form of ammonium salts and superphosphate.	0.0405	1050	5.3	21½	20½
5	Manured with phosphorus as superphosphate and potassium, sodium and magnesium sulphates, but no nitrogen.	0.0642	1665	8.4	15	10½
2B	Manured with 14 tons per acre of farmyard manure. This contains nitrogen, phosphorus and potassium.	0.0560	1307	6.6	41	39

It should be noticed that in both the plots 3 and 10A, the crops were starving for want of available phosphorus. In plot 10A the stimulating action of nitrogen had produced heavier crops than plot 3, the unmanured one, yet considerably lower than in plot 11 where phosphorus had been supplied in addition to nitrogen. In plot 7 a very complete manuring, including phosphorus, nitrogen and potassium, had been supplied and the yield of wheat was double as great as that of plot 10A, being 35 bushels instead of 16½ bushels; whilst the yield of straw was more than double, being 33½ cwt. instead of 13½ cwt. Here the available phosphoric acid was 0.547 per cent. or 7.2 times as great as in the plots 3 and 10A, which had received no phosphorus. Plot 5 had received a manuring complete, except for the absence of nitrogen, and the crop, owing to nitrogen starvation, amounted to 15 bushels of wheat and 10½ cwt. of straw, only a trifle above the crops on the unmanured land. As the crops from this plot had been small, but little phosphorus had been removed in them, and this accounts for the accumulation of available phosphorus in the soil, which contained 8.4 times as

much as in plots 3 and 10A. In plot 2B the land had received heavy dressings of farmyard manure and consequently abundance of nitrogen, phosphorus and potassium and, in return, yielded heavy crops. Here the available phosphorus was 6.6 times that in plots 3 and 10A.

A very interesting question is:—what amount of available phosphoric acid is so small as to constitute phosphoric starvation. The author concludes that when a soil is found to contain as little as about 0.1 per cent. of phosphoric acid, soluble in a 1 per cent. solution of citric acid, it stands in immediate need of phosphatic manure. It is more difficult to decide at what point of richness in phosphoric acid the further supply of phosphatic manure is unnecessary; the author thinks that this limit lies somewhere below 0.4 per cent., probably at 0.3 per cent.

It must be remembered that these conclusions relate to cereals, and that for root crops, more especially turnips, the limits would probably be higher.

POTASH RESULTS.

In the case of potash, even more than in that of phosphoric acid, a knowledge of the total amount present in the soil is no clue as to the need or otherwise for potassic manures. The Broadbalk soil contains probably 15 tons of potash in an acre to a depth of 9 inches; but it is in a dormant form, forming a reserve stock for the distant future, and is only very gradually rendered available for plant use by the natural processes going on within the soil. Even with this great reserve of potash the soil is unable to furnish a sufficient annual supply to the wheat crop under a system of continuous cropping, unless restitution is made in the form of manure.

The following table gives a selection of some of the numerous results relating to potash:—

Plot.	Annual manuring for 50 years (with only minor variations during the earlier years).	Percentage of potash (K_2O) in fine dry soil, 1st 9 inches, dissolved by 1 per cent. citric acid solution.	The potash (K_2O) expressed as lb. per acre.	Proportional amounts of potash.	Average yield per acre, 1889-94.	
					Wheat.	Straw.
3	Unmanured continuously.	0.0032	83	1	bushels.	cwt.
10A	Manured with nitrogen only, in the form of ammonium salts, since 1844.	0.0032	83	1	13	9
11	Manured with nitrogen and phosphorus only, in the form of ammonium salts and superphosphate.	0.0032	83	1	16½	13½
13	Manured with nitrogen, phosphorus and potassium, in the form of ammonium salts, superphosphate and potassium sulphate.	0.0188	487	5.9	32½	32
7	Complete manuring, with mineral substances: phosphorus in the form of superphosphate, nitrogen as ammonium salts, potassium, sodium and magnesium sulphates.	0.0232	602	7.3	35	33½
5	Manured with phosphorus as superphosphate and potassium, sodium and magnesium sulphates, but no nitrogen.	0.0308	799	9.6	15	10½
2B	Manured with 14 tons per acre of farmyard manure. This contains nitrogen, phosphorus and potassium.	0.0384	896	11.0	41	39

From these results it appears that in plot 11, although it had been abundantly supplied with nitrogen and phosphorus, the readily available potash had evidently been largely exhausted and the yield of wheat, 21½ bushels, and of straw, 20½ cwt., was only about two-thirds of that of plot 13, which had received the same manuring except that potassium, in the form of potassium sulphate, had been added, and which yielded 32½ bushels of wheat and 32 cwt. of straw.

When potassium sulphate was applied, the amount of potash received by the plot was about 100 lb. per acre per annum, so the figures show that this manuring caused an accumulation of available potash in the soil. The potash added in the farmyard manure was about double the above amount, and in this plot, too, available potash accumulated.

As to the critical amount of potash which may be taken as showing that the soil does not need any special application of potassium salts, the author considers that when a soil contains as much as 0.1 per cent. of citric-acid-soluble potash, this point is reached, at any rate as regards cereals.

LEATHER FOR BOOKBINDING.

The interesting report of the Society of Arts' Committee on Leather for Bookbinding has already been reviewed in this JOURNAL (Vol. VII, p. 208), where a summary of the principal conclusions and recommendations will be found. The experimental work, which was necessitated by the enquiry, was entrusted to a small sub-committee of experts, consisting of Dr. J. Gordon Parker, Professor Procter and Mr. A. Seymour-Jones, who carried out a large number of experiments which yielded valuable information upon the subject under investigation. The results could, of necessity, only be briefly given in the report itself, but a detailed account of the work has now been furnished by Dr. Parker in a lecture at the Society of Arts (*Journ. Soc. Arts*, Vol. L, p. 25), and, as many of the points investigated are of extreme importance to leather manufacturers and bookbinders, they may be dealt with more fully than was previously possible.

It was definitely established to the satisfaction of the Committee that nearly all modern bookbinding leathers show a much greater tendency to decay than those used previous to 1830, and the inference was that this could only be due to modern methods of leather manufacture. A careful examination of a large number of these old bindings, which had proved so permanent, revealed the following facts:—(1) the leather was generally thicker than that at present used; (2) the fibres of the leather were in the natural condition, *i.e.*, running transversely to the surface, whereas in modern leather, owing to the stretching and tight setting-out of the skin, the fibres are distorted and run more parallel to the surface; (3) the

amount of tannin present was less than that found in more modern bookbinding leather; and (4) in most cases the old leathers, which had stood so well, were tanned with either sumach or oak-bark.

With reference to the first two points it needed no investigation to prove the superiority of the older over the modern practice. The splitting or paring down of the skins, often to such an extent that only the thin grain surface remains, cannot but diminish the durability, since it removes the toughest part of the leather, while the custom of drying many kinds of leather in a tightly-stretched condition is also inimical, as it destroys the elasticity and, by displacing the fibres, hastens the deterioration. The other two points, viz., the influence of different tanning agents and the extent to which the tanning was varied, were made the subjects of careful investigation, especially as in nearly every case in which a modern leather had stood well it was found to have been tanned with sumach. Sumach and oak-bark are still used for the preparation of the best classes of leather, but large numbers of skins are treated with other materials, such as quebracho, larch bark, gambier, and mimosa bark, while thousands of skins tanned with turwar bark are imported from India. The latter, which are known in the trade as Persian morocco, Persian sheep, and East Indian calf, are usually re-tanned with sumach in this country, and had been found to be the least durable of all modern bookbinding leathers. Comparative experiments were, therefore, made by tanning different skins, calf, goat, and sheep, with the tanning materials in common use, and then testing the leathers by exposing them for long periods to the action of light, heat, the combustion products of coal gas, etc., in imitation of the usual library conditions. In every case the most resistant leather was that tanned with sumach, followed in order of merit by myrobalans, chestnut extract, oakwood extract, oak bark, gambier, larch bark, quebracho, pistacia and tamarix; while the worst specimens were the East Indian skins tanned with turwar bark, especially those which had been re-tanned here with sumach. This latter practice was shown by a further series of experiments to diminish the life of the leather by about half, probably owing, as will be seen later, to the use of sulphuric acid in the process, but at the best these skins are almost worthless for bookbinding purposes. It was also found that in every case the leather which was lightly tanned was much more resistant than the corresponding piece which had been more heavily tanned in accordance with the present custom.

Another important point which demanded attention was the decay of modern calf, tanned with oak bark, and for the purpose of investigation several of these skins were obtained from librarians and bookbinders. It was found on examination that most of these contained free sulphuric acid, which had evidently been used to brighten the colour, in quantities varying from 0.2 to 0.8 per cent., and consequently a number of other skins perfectly free from acid were also obtained for comparison. Pieces of these leathers were subjected to the tests already mentioned, with the result that the specimens free from acid proved very satisfactory, whereas those which contained acid were very adversely affected, changing in colour to red-brown and becoming hard, brittle and easily abraded by friction. The practice of using sulphuric acid for brightening the colour of oak-tanned calf is quite recent and only became general twenty or thirty years ago. It has a wonderful effect in removing stains from the skins, in rendering the colour brighter and more uniform, so that the leather presents a much better appearance, but its use appears to be injurious. In these experiments it was again observed that the more heavily tanned skins were the least resistant.

The methods employed in dyeing and finishing the leather were next examined, in order to determine whether any of these were likely to be the cause of deterioration. It was conclusively proved that if acid had not been used in the dye-bath the leather was in no way affected by the exposure to the test conditions and, in fact, the finishing appeared to protect the surface; but, on the other hand, in those cases where an acid dye-bath was employed the leather showed signs of decay, becoming hard and brittle. In these last experiments five different kinds of skin were employed, viz., calf, sheep, goat, seal and pig, and of these the two first were most affected by the acid.

The examination of a large number of samples of different kinds of leather of English manufacture showed that the use of sulphuric acid, either for improving the colour or in the dyeing process, has become almost universal. Thus, Dr. Parker found that 36 out of 38 samples of morocco, 12 out of 18 samples of skivers, and 27 out of 32 samples of calf, contained free sulphuric acid, while this was also present in all the samples of Persian goat, Persian sheep and pig skin, numbering 18, 23 and 6 respectively, which were examined. The same condition was found in French and German bookbinding leathers; eight different samples of French Levant morocco were all found to contain a large quantity of free sulphuric acid, varying from 0.6 to 1.3 per cent., and of twelve samples of German origin, eleven contained acid, the maximum amount being 0.85 per cent. The large percentage of free acid remaining in the leather was rather surprising in view of the thorough rinsing to which the skins are finally subjected in the tannery, but experiments showed that it is practically impossible to completely remove the acid by simply washing in running water. A piece of Persian leather, containing one per cent. of sulphuric acid, was continuously washed for five days, and was then found to retain slightly over 0.2 per cent. It is therefore recommended that in those cases where it is absolutely necessary to use sulphuric acid, the skins should be washed with water containing sodium (or potassium) lactate or acetate, whereby the free acid can be completely neutralised without producing any objectionable effects.

The quality of the leather manufactured from skins imported in a preserved condition was also investigated. Many of these are preserved in salt and, on tanning, were found to yield a leather much weaker than the dried or fresh skins, especially in those cases where slight decomposition had occurred. Large numbers of sheep skins, pickled in a solution of salt and sulphuric acid, are exported from New Zealand and Australia, and the leather obtained from these was also very greatly inferior to that from unpickled skins.

The practices of the bookbinder also received attention, with the result that the methods employed for the production of sprinkled leathers, and the use of oxalic acid for brightening the colour, are condemned, as tending to the rapid deterioration of the leather. The various pastes employed were usually found to be harmless, but much damage is done to the leather by stretching it too tightly over the back of the book.

One other fact of interest was brought out by the enquiry, viz., the large extent to which ordinary sheep skin is got up in imitation of other leathers. Books were met with apparently bound in Levant morocco, hard grain morocco, straight grain morocco, pig skin, calf skin, crocodile and alligator leathers, and all of these on microscopic examination were proved to be common sheep skin which had been stamped with the special grains and markings of the different skins.

These results completely justify the findings of the Committee, and it is to be hoped that the attention which has been devoted to the question will result in a great improvement in the durability of the present bookbinding leathers.

THE MANUFACTURE OF VARNISH.

It is well known that oil varnishes are usually made by heating fossil resins, such as the "kauri" of New Zealand, until they melt, and stirring into the molten mass linseed oil heated to a temperature sufficiently high to ensure complete miscibility of the oil and resin. In such a process a great loss of volatile matter from the crude resin occurs, often to the extent of 40 or 50 per cent. by weight; this loss is not only uneconomical, but is a source of danger, since the material driven off by the heat is very inflammable. It has frequently been suggested that the mixture of oil and resin might be more satisfactorily made by heating the materials together under pressure, and a series of experiments of the kind has been made by

Mr. A. J. Smith, the results of which have been published in a recent number of the *Journal of the Society of Chemical Industry* (November 30, 1901). In these laboratory experiments, the resin, in a finely powdered and dried state, was mixed with oil and heated in a Jena glass tube at a pressure of about two atmospheres. Solution occurred in the case of *kauri* in about twenty minutes with the formation of a pale yellow varnish, which, owing to its large content of resin, required more turpentine than usual to thin it down to working condition. The author has successfully carried this process out in melters of ten gallon capacity, so that it appears to be workable under manufacturing conditions, but he gives no information regarding the qualities of the varnish so produced, and in particular of the permanence or otherwise of the material when applied to wood.

It may be mentioned here, as a point of considerable importance, that the brilliance of a varnish depends upon the non-crystalline character of the resins from which it is made, and the dull appearance which many cheap varnishes acquire after a time is due to the crystallising out of simple resin acids like abietic and pimaric acids, which are the chief constituents of such resins as colophony, but also occur to a smaller extent in the more valuable resins *kauri* and *anini*. When the latter are treated in open vessels, the simpler resin acids already referred to volatilise, leaving the really valuable constituents behind, which, when combined with oil, produce a satisfactory varnish. It is to be expected, therefore, that the pressure process as suggested by Smith will not furnish a varnish of the same high quality, as regards permanence, as the older process of melting in open vessels.

In the discussion which followed the reading of this paper, Dr. Lewkowitsch remarked upon the unsatisfactory state of chemical knowledge on the subject of resins, and the consequent difficulty of classifying them and ascertaining the purity of commercial specimens, in spite of the fact that the manufacture of varnish was carried out on a very large scale, and was a matter of great industrial importance to this country. There is no doubt that a thorough investigation of many of the natural resins would disclose new sources of material for the manufacture of the finer kinds of varnish, and bring to light methods of treating the poorer resins, so as to improve their varnishing properties; but the subject is such a difficult one that it is not likely to be taken up while so many more promising fields are open to chemical investigators.

MINERAL PRODUCTION IN INDIA.

There has recently been issued from the office of the Director-General of Statistics for India the annual report on the production of minerals in that country, which gives some interesting figures showing the extent to which the mineral wealth of India is at present exploited.

It appears that the average output of salt per annum is nearly 1,000,000 tons, derived from the salt mines of the Punjab, the lakes and wells in Rajputana and Upper Burma, and from sea water in Madras, Bombay, Sind, and Lower Burma.

In spite of the wide-spread production of salt in the country, considerable quantities are imported from Europe *via* Liverpool and Hamburg, the average import for the last five years having been 398,000 tons.

The production of saltpetre (nitre) has declined considerably since the development of the Stassfurt mines has enabled Germany to manufacture potassium nitrate from the Stassfurt minerals and Chili saltpetre (sodium nitrate), but there is still produced in India a considerable quantity, since 404,378 cwt. were exported from Calcutta annually during the period 1896-1901.

The most satisfactory progress is shown by coal-mining in India, to which attention has already on several occasions been drawn in this JOURNAL, the output having increased from 3,540,000 tons in 1895 to 6,118,000 tons in 1900. Indian coal is now being extensively used for industrial purposes, except in Bombay, which is too remote from the coalfields, and is still therefore dependent upon external sources for fuel.

The output of iron ores is still very small, and iron is so far only smelted in the Raniganj district of Bengal, where it occurs in close proximity to coal; in this neighbourhood 57,000 tons of iron were manufactured in 1900, the total production in India being 63,000 tons.

It does not appear to be possible to further develop the Indian iron industry on the present lines, and the smelting of this metal will probably only be successful when carried on with large capital on a sufficiently extensive scale to enable the smelters to secure advantageous transport and freight rates.

A considerable amount of gold is produced in Mysore, the output now exceeding 500,000 ounces per annum. Small quantities are also found in the Nizam's dominions, and in the rivers of Northern India, the total production for 1900 being 513,266 oz., valued at over two millions sterling.

Petroleum is worked in Burma and Assam, the former produced 37,000,000 gallons last year, and the latter 1,000,000 gallons. This output is, however, not sufficient to meet the total demand in India, and a further 72 million gallons were obtained from Russia and the United States.

The foregoing include the principal minerals worked in India, but mica, corundum, manganese ore and tinstone are also found and exported in small quantities, whilst considerable quantities of precious stones, in particular the *jade* and *rubies* of Upper Burma, are sent abroad.

THE MAGNETIC IRON SAND OF THE ST. LAWRENCE.

The deposits of magnetic iron sand occurring on north shore of the river St. Lawrence have been known from very early times, and were worked from 1867 to 1875 by the "Moisie Iron Co." This company bought large tracts of land in the vicinity of Moisie and built there eight bloomery furnaces. The ore was first concentrated by means of magnets supplied with sand from an endless table or travelling band, and reduced in the furnace by means of charcoal as fuel. The blooms produced were exported to the United States, but the increased duty imposed in 1875 caused the company to close their works, and since that time this ore has not been utilized.

The most important deposits occur at Natashquan, Moisie, and St. Jean. The deposit of St. John river extends from its mouth, six miles to the north-east. It is 2 to 10 inches in thickness, the richest part occurring at Point Noire, four miles from the river St. John. The Natashquan deposit extends from the mouth of river so-named eastward for about 20 miles, and there is in sight between low water mark and the timbered ground a strip of sand from 100 feet to 400 feet wide, with dunes ranging from 5 to 50 feet in height. The thickness of the deposit varies from one inch to two feet on level ground, and contains from 20 to 95 per cent. of iron sand, while the dunes would give from 40 to 60 per cent.

Mr. Obalski considers that these deposits have been formed by the disintegration of ferruginous rocks, such as anorthosites of the Laurentian series, by the seas of past geological periods which brought about a concentration of the product of disintegration according to density. The sand, besides magnetite, contains ilmenite, garnets and quartz, from which it can be almost completely separated by means of magnetic concentrators. The following analyses show the composition of this ore:—

	Moisie.	Natashquan.
	Raw.	Concentrated.
	per cent.	per cent.
Metallic iron	55.23	70.01
Silica	—	0.22
Sulphur	—	0.026
Phosphorus	—	0.030
Titanium	9.6	nil.
		0.420
		69.78
		0.321
		0.011
		0.015
		0.860

Mr. Obalski recommends the working of the sand by means of steam shovels feeding cylindrical driers, from whence the ore would be taken to electro-magnetic separators and then shipped. The motive power could be supplied by water-power in these regions; wood-fuel is abundant, or Nova Scotia coal could be landed there for \$3 a ton.

THE QUININE TREATMENT OF MALARIA.

Until quite recently it was generally believed that malarial fever in man was caused by the inhalation of foul air from swamps; but this theory is now untenable, since it is proved to be possible to produce the disease in a healthy person by inoculation with the blood taken from a malaria patient. The theory is accepted in medical circles that the disease is produced by the introduction into the blood of a specific germ or bacillus, and the peculiar liability of inhabitants of swampy districts to the disease is explained by the observation made by Ross and others, that the mosquitoes which occur in great numbers in such districts are "hosts" for the malaria germs. A person bitten by a mosquito infected with the germ will, therefore, be inoculated with malarial fever.

Various observers have lived in malarial districts in Italy, in mosquito-proof houses, without contracting the disease, conclusively proving the part played by these insects in the dissemination of malaria.

Professor Koch has recently suggested the use of quinine as a means of combating malaria, since he has observed that its judicious administration to malaria patients causes the disappearance of the specific bacillus from their blood. He has used quinine in this way for some years with successful results, and gives the following particulars of the dosage which he has found most suitable:—In ordinary cases 1 gram (15.432 grains) should be taken by adults for two days in succession with intervals of nine days, for a period of two or three months. In obstinate cases 1 gram should be given for three days with intervals of seven days; in cases of quartan malaria larger doses are required. Where the patient is averse to taking quinine the same dose should be subcutaneously injected.

The author gives many examples showing the effectiveness of his quinine treatment, a feature of the cases being the increasing rarity of relapses. He ascribes the great decrease of malaria in Europe to the use of quinine, in spite of the existence of swamps and mosquitoes, and gives the following instances from his experience:—

In the German army 30 years ago the cases amounted to 54.5 per thousand, whilst at the present time the rate is only 0.45 per thousand. At Spandau, a particularly unhealthy place, the garrison ratio was 664 cases per thousand, whilst it has now diminished to one per thousand; at Pola, the chief seaport of Istria, in 1860 there were 887 cases per thousand, while the latest returns show a fall of this ratio to 30 cases. In each of these examples the decrease is traceable to the use of quinine. A peculiar feature is shown at Pola, where the ratio in the army has decreased, whilst it has increased amongst the civilian population. This is considered to be due to the medical supervision and the prompt measures that can be taken in the garrison.

PLANTING AND NEW PRODUCTS IN ZANZIBAR.

The Zanzibar Annual Report, of Mr. R. N. Lync, Director of Agriculture, furnishes a few interesting notes on planting progress, etc., in that district. As a result of extensive experiments with Liberian and Arabian coffee plants, he recommends in future the adoption of the Arabian species. About 2,400 Liberian coffee plants were grown on $4\frac{1}{2}$ acres of land and produced an unusually good result; although they suffered to some extent from the attacks of snails; but this pest was checked by the application of lime and ashes round the base of each plant. The Arabian coffee was quite as successful and produced a much better berry, commanding a higher price.

Tea cultivation appears to be still in an experimental stage. The soil is highly suitable, but there is only sufficient land to grow tea for local requirements; at present 13 acres are under cultivation with tea plants reared from Cinghalese seed.

Cacao has been tried to some extent, and has proved a delicate plant to rear. It is liable to attacks from insects, and suffers considerably during periods of extreme heat and drought. The plants of *Pithecolobium saman* and the jak tree have been adopted as a permanent shade for the cacao. The *bois immortelle*, which is extensively used for that purpose in Ceylon and Trinidad, does not thrive satisfactorily and has been discarded. The hot, dry weather which affected the cacao was equally destructive to young Para rubber trees. It has also been noticed that low-lying moist ground was not suited to the cultivation of the latter.

Vanilla has proved successful, the plantations now containing over 3,000 vines in very good condition; some are shaded by "mbono" creeper, for the remainder the adjoining forests afford sufficient protection. Results show that the "mbono" is hardly sufficient, whilst the forest shade is, in certain cases, too dense.

Experiments have been made with the fibre of China grass (*Behmeria nivea*) on a small scale. Considerable attention has been paid to the production of "fine" cloves, which by their enhanced value easily repay the extra trouble entailed. It is important that the sending to market of large quantities of "fine" cloves (say 400 or 500 bales) should be avoided. The small parcels of 25 to 35 bales, i.e. 900 to 1,200 lbs. of "fine" cloves readily command 2d. per lb. more than the "fair" cloves, and the extra labour involved such as hand-picking, special drying, etc., is very slight.

The cocoanut trees in the Dunga plantation have not yielded well, the last year having been bad for all kinds of fruit.

GENERAL NOTES.

SUGAR-REFINING IN ENGLAND.

A paper on this subject, dealing especially with the improvements, both in processes and machinery, which have been introduced during the last twenty-five years, was read at a recent meeting in Glasgow of the local section of the Society of Chemical Industry, and is printed in the current number (November, 1901) of the official *Journal* of the Society.

The author, Mr. T. L. Patterson, F.I.C., describes and discusses with considerable detail methods for the decolourisation of brown sugar, the concentration of syrups in vacuum pans, and the regeneration of animal charcoal by processes which do not impair its decolourising qualities, and finally gives some account of the condition of this industry in England as compared with its position in 1875. The consumption of sugar in this country in 1875 was 860,000 tons, equivalent to 60 lb. per head of the population; in 1900 this amount had increased to 1,489,000 tons, equal to 81.2 lb. per person. During the same period the English output of refined sugar fell from 760,000 tons to 610,000 tons, while the import, chiefly of German and Austrian origin, increased from 100,000 to 950,000 tons, i.e., the import increased 81.5 per cent. while the home production decreased by 20 per cent.

During the same period the number of refineries in operation in this country has fallen from 42 to 11; thus in London 20 factories were open in 1875, while only two are now at work, in Liverpool the figures are respectively 9 and 3, and in Greenock 13 and 5. The reason for this decline is, of course, the operation of the bounty system in Germany, Austria, Belgium, and France, and it is only by continually improving the appearance of their sugar that British makers have been able to obtain the enhanced prices which enable them to make a profit in the face of such unfair competition.

ZEBU CATTLE IN TRINIDAD.

In 1879 a few young, pure-bred Zebu cattle were introduced into Trinidad, and reared on the Government farm, with the object of improving the stock available there; the manager, Mr. C. W. Meaden, has furnished a report on the herds that have resulted from that introduction. Sufficient time has now elapsed to enable comparison to be made of the utility of the imported cattle with that of the native breeds, with the result that the superiority of the imported animal has been clearly established. They are capable of long-continued exertions in general agricultural work and require but little attention. On the other hand, as the following analyses show, the Zebu cows give milk somewhat weaker than that of the native animal.

	Sp. Grav.	Solids (not fat).	Fat.	Ash.	Cream.
Zebu cow	1031.0	8.9	3.72	0.72	4.5
Milch cow	1027.7	9.09	4.55	0.75	7.0

This defect has, to some extent, been remedied by crossing native cows with the Zebu bulls.

The beef obtained from Zebu cattle is of high quality when the animals are fed for slaughtering. There is already a considerable demand for pure and half-breed cattle of this class in the island, and their production appears to be a profitable industry, the prices obtainable being from £50 to £100 each for bulls and £20 to £30 for heifers.

RAFFIA FIBRE.

This material is the well-known "bast" employed by gardeners for tying vines, flowers, and plants to supports. It is obtained from the raffia or rofia palm, indigenous to Madagascar, and growing to an almost unlimited extent in that island, which, at present, according to the *Indian Agriculturist* (November, 1901), enjoys a complete monopoly in the supply of this fibre.

The branches of this palm are of the usual character, and consist of a central stalk bearing from 80 to 100 long green leaves arranged in an imparipinnate manner. The individual leaves contain a central midrib, which the Malagasy utilize for the manufacture of baskets, and a lamina from which the outer skin can be peeled, leaving an inner layer that in turn can be readily removed, torn into strips and dried in the sun, when it becomes the "bast" of commerce.

It was at one time woven by the natives into a coarse kind of cloth, generally used for wrapping goods, but a somewhat finer variety is still used as clothing by certain coast tribes.

For export to Europe the material is collected into skeins, and these again into bales, like those in which raw cotton is imported. Its softness and tenacity make it almost indispensable to horticulturists, and so it always commands a good price in the European markets.

THE ALKALOIDS OF JABORANDI LEAVES.

A short account of recent work on the characterisation of the alkaloids of this drug has already appeared in this *JOURNAL* (Vol. VI., 294), when it was pointed out that the leaves now found in commerce, viz., those obtained from *Pilocarpus microphyllus*, contained *pilocarpine* and its isomeride *isopilocarpine*. Since that time further work, both in England and Germany, has made it possible to obtain some further insight into the constitution of the chief alkaloid pilocarpine, and has proved that the structure previously assigned to this substance by the French chemists, Hardy and Calmels, is inaccurate. The oxidation of the alkaloids furnishes ammonia methylamine and a series of complicated paraffinic acids, of which the lowest member has been obtained artificially and its exact constitution thereby determined (*Jowett, Journ. Chem. Soc., December, 1901*). The facts already ascertained do not seem to be in harmony with the view that pilocarpine is a comparatively simple pyridine derivative, as was formerly assumed. It is to be hoped that the investigation, which is still proceeding in England in the laboratories of a firm of alkaloid makers, will result eventually in the synthetic production of pilocarpine, and so reduce the price and ensure a constant supply of this alkaloid, which now finds a continuously increasing application in medicine.

THE INDIGO AND COTTON CROPS.

The general memorandum on the indigo crops of India shows a general decrease of the area under cultivation; this decline ranges from 11 per cent. in Bengal (last year the decrease was 20 per cent.), to 40 per cent. in the North-West Provinces. As the weather in Bengal has been consistently favourable, it is estimated that the out-turn will be 85 to 90 per cent. of a normal crop. In the North-West Provinces and Oudh circumstances have not been so favourable; the out-turn is variably estimated at from 50 to 85 per cent. of the normal.

In the Punjab the area under cultivation is about 86,000 acres, as against 115,700 acres last year; this decline is chiefly accounted for by a deficient supply of water. A slight increase is noticeable in Madras, the area being now 166,000 acres. In every district general complaint is made of the decrease in prices, which is causing many factories to close.

Reports on cotton crops show a decrease in the Punjab of 12 per cent. on the area sown last season, in the North-West Provinces the average is about the same, and in Behar an increase of 17 per cent. above the average is recorded. The exact state of the crops in other districts is not at present known.

THE MINERAL DEPOSITS OF PALESTINE.

This forms the subject of a communication to Kirchhoff's *Technische Blätter* from a German mining engineer in Palestine.

Valuable mineral deposits have recently been discovered on both sides of the Jordan and the Dead Sea, consisting mostly of phosphate, the most important ingredient of artificial manure; whilst investigation has shown that the bituminous chalk springs of Nebi Musa contain from thirty to forty per cent. of asphalt. These mineral deposits afford the necessary material for an important industry, but better means of communication are necessary to ensure their development. This may not be far distant, now that the Turkish Government is planning a continuation of the Jaffa-Jerusalem railroad.

Norwegian Wood Pulp.—Reporting upon the trade and commerce of Norway, the United States Consul-General Dundas states that the production of pulp, especially mechanical pulp, was not appreciably larger in 1900 than in the preceding year, owing to the scarcity of water, but prices were very high—on the average about 55s. per ton, compared with 28s. to 29s. in the summer of 1899, while as much as 65s. was paid for prompt delivery—and as the demand was very great, manufacturers were masters of the situation. But only about half of the production profited by the rise in prices, the rest having been sold in advance. As formerly, the United Kingdom was the largest customer, with Germany, France, Belgium, Spain, and others in order of precedence.

	1899.	1900.
The quantity exported was:—Dry	19,768 tons.	21,546 tons.
Wet	284,023 "	301,545 "
Of which from Christiania:—Dry	8,741 "	6,670 "
Wet	34,265 "	38,052 "

The same conditions applied to cellulose, or chemical pulp, added to which the high price of coal is said to have been felt in no small degree by those works dependent on its use, so that on the whole 1900 is characterised as only a fairly good year, some factories doing well, but others the reverse. The total export was 94,885 tons dry and 10,288 tons wet (of which 68,525 tons went to the United Kingdom), compared with 75,731 tons dry and 7,490 tons wet in 1899. The quantity exported through the port of Christiania was 31,403 tons dry and 3,948 tons wet in 1899. The foregoing figures include a little re-exported Swedish cellulose.

LECTURES AND PAPERS.

"PLANTERS AND PLANTING IN TROPICAL GREATER BRITAIN."

(By R. HEDGER WALLACE, Esq.).

SIR EDWARD NOEL-WALKER presided on the 2nd December at a lecture delivered at the Institute by Mr. R. HEDGER WALLACE, entitled "Planters and Planting in Tropical Greater Britain." The Chairman, in his introductory remarks, said that having served for many years in tropical portions of the Empire, he had had abundant opportunities of making friends with planters, in those parts of the world, and of becoming acquainted with tropical matters of various kinds. He should, therefore, listen with great interest to what Mr. Hedger Wallace would have to say, and trusted that the audience would at any rate learn something of the resources and industries of the tropical colonies. The subject was at the present time one of considerable importance as, owing to the keenness of the competition that now prevailed, the days had gone by when people could go to our colonies and confidently expect to make fortunes with little or no effort on their part. Mr. Hedger Wallace was well fitted to speak on the subject, as he had had practical experience in India and in Australia, where he had been employed as an expert by the Government. He had also travelled in many other parts of the Empire.

Emigrants from these shores who went abroad to earn their own living by means of agricultural pursuits might, said Mr. Hedger Wallace, be divided into two classes:—those going to countries where the climate was temperate and where they intended to permanently reside or become "settlers"; and planters: those going to tropical countries, who regarded themselves more or less as exiles, trusting some day to be able to return to their native land. Climate, of course, was the reason of this. The planter's work might lie in the unhealthy wet coast jungle land, or in the wet condensation forest uplands of the interior, or in the monsoonal area between the two. He was thus compelled, on account of climate, to place a premium on his health varying with the salubrity of the place to which he went. On the other hand, tropical regions, suitable for cultivation, were much more productive than similar areas in the temperate zones, so that a planter had a reasonable expectation of making money much faster than the settler.

A planter did not, as a rule, himself perform any of the actual manual work or labour; that was all done by hired native labour—negroes, peons, and coolies. His business was to control and direct this labour so that the cost of production might be economical and the out-turn profitable.

With many economic plants, and their products, the planter was responsible not only for the labour-force, the extension of the plantation, and for the growth of the plant, from the seed in the nursery until it was in full bearing in the plantation, but also for the manufactured product. The tea-planter, for example, was responsible for the growing of the plant, and for the harvesting and gathering of the produce, and also for all the details of its manufacture into the commodity to be retailed. The coffee-planter's duties were as extensive, and the sugar-cane-planter had also to take up one or two of the processes of manufacture and refining in addition to growing the crop.

This practice, however, was not universal; some planters, by a system of advances, got the plant, or crop, grown for them by natives and their responsibility, in such cases, did not lie so much with the growing crop as with the methods, or processes, of curing, extracting, or manufacturing it into the marketable commodity.

The qualifications desirable on the part of the prospective planter, as could be readily understood, were exceedingly varied. A young man might go out to an Assam tea-plantation and be successful, while if he had gone to a Nyassaland coffee plantation he might not have been regarded as at all a suitable assistant; the duties expected of him in the two places being very different. In Assam the workmen he would supervise would be, in their way, skilled and with long accumulated experience to rely on, and he would merely have to see that they did their work; while in Nyassaland, on the other hand, the young planter would have to teach his labourers how to do everything required of them—to make bricks, to build sheds, to do carpentering and iron work, to look after live-stock, etc., etc.—in fact, he would have to teach them their trade as well as supervise their work.

The managers of, and assistants on, plantations were generally drawn from the English middle-classes and were usually men of good education, although without specific training for their vocation. Men of the artisan class—such as gardeners—had been tried, but they had not appeared to have shown themselves possessed of any qualities that made them better fitted for the work than the young public-school man, in fact they did not do as well—possibly because so much of a planter's business consisted in managing and directing. Mr. Wallace was of opinion that planters would still continue to be drawn from the middle classes, although in future they would have to obtain some preliminary training for the work expected of them.

At present the system carried out was purely a form of apprenticeship. When a young man joined a plantation, his services were of no value. In time, as he worked out his first agreement, he began to pick up the rudiments of his calling, experience being his great master. In the present circumstances the character, ability and zeal of the manager, under whom he served as an assistant, were very important elements in influencing and establishing the future prospects of a young man. Anyone who had been among planters in the East or West Indies, and America, would have noticed how men from certain plantations were in demand, and others were passed over, owing simply to the reputation which the plantations and gardens had gained under the managers in charge.

What was very desirable, with a view to making planters more progressive, was that before leaving the old country they should get a general training for the work that lay before them. Under the present regime they were exceedingly conservative and perpetuated old systems, methods and processes, simply because these had been the ones learned by them when they had first began their planting life as junior assistants.

Throughout the lecture Mr. Hedger Wallace frequently referred to this point: the necessity of young planters receiving some sort of training before leaving home. The haphazard way in which parents sent their sons to the tropics, without troubling themselves to see that the young men were properly trained and equipped for the life that lay before them, was remarkable. Of course the embryo planter could not, in the United Kingdom, obtain the experience, as cultivator or manufacturer, which must underlie successful work, and which could only be gained from a knowledge of local conditions. But the views and opinions of those who had gained local experience, in various parts of the world, could be noted, formulated, and correlated, to form the groundwork of the *Principles of Commercial Crop Cultivation*; and the future planter, before leaving home, could then thoroughly study these details. He should also obtain a fair idea of commercial geography, some insight into office routine, a fair grasp of the principles of book-keeping, and if possible some knowledge of machinery in a mechanical workshop.

This last qualification was sometimes of the utmost importance, as, in some countries, the planter had to be his own engineer and mechanic; while in others, although he might only have to exercise supervision, yet he would have to accept full responsibility for the proper working of the machinery and appliances.

Before leaving England a young man should know how to take care of his health in a tropical country, where the climate and general conditions were so different to those at home. This question of the health of the white man in hot countries was, of course, now receiving a great deal of attention. The sudden change from a land of rain, fogs, east winds, and little sunshine, to a country where the sun's rays were vertical, the rain violent, and the mean temperature fully 20 degrees higher than at home, was apt to be trying even to those in

the best of health. People in this country often failed to appreciate the fact that there were local differences of climate within the tropics and to think of, say, India as a country of but one climate. In the tropics one could meet with hot, cold, and wet seasons. In some areas the temperature was so moist that there was no evaporation from the skin, and in others the air was so dry that no moisture remained on the skin. The conditions that affected climate in the tropics were distribution of land and water, nature of the soil and vegetation, and position in respect of elevation or depression.

The temperate zones were rapidly being filled up by the white races, but the richest and most productive portions of the earth were situated in the tropics, from whence were obtained: sugar-cane, tobacco, tea, coffee, indigo, cocoa, cinchona, cotton, jute, ground nuts, cocoanuts, drugs, dye-stuffs, rice, teak, mahogany and other woods. It had been estimated that about one-fourth of the whole British Trade was in tropical produce.

Although the settler possessed a great many advantages over the planter, still the life and work of a planter was not without its attractions to those who from early youth had been removed from the conditions that affected the artisan and labouring classes.

The power of management, direction, and control, appealed to the planter's class instincts. The life might be lonely and yet it could be made pleasant, provided the work was to a man's liking and he took care of his health. He might feel that he was exiled from old and familiar scenes and surroundings, yet, when he returned to them, the days of his sojourn abroad were, to the old planter, generally days of pleasant memory.

Mr. Hedger Wallace showed an excellent series of slides illustrating the methods of cultivation of a number of the chief economic products of the tropics, pointing out their main characteristics. Among others were views of: tea-planting in Assam, coffee-planting in Nyassaland, the tobacco and spice plantations of North Borneo, lime cultivation in Dominica, cocoa cultivation in Trinidad, and banana- and pine-growing in Jamaica.

Sir Edward Noel-Walker, in proposing a vote of thanks, said that he was glad to find himself in general agreement with what had been said in the lecture, especially with regard to the necessity of young men, who were going out to the colonies, understanding beforehand a little about the nature of their future employment. He was of opinion that a considerable change would shortly take place in the planting world, and that the effect of the present keen competition would be to bring about a separation of those various kinds of work now performed by the planter. For example, central factories would be established for the manufacture of sugar, and the cultivation of the cane would be left to smaller cultivators. This change would bring about a revolution in the present social standing of the planter, the tendency probably being to lower his position; on the other hand, however, the transference of the growing of the plant to smaller cultivators would benefit the artisan class. He also referred to the difficulties with which the planter had to contend, as compared with the settler, in regard to climate, recreation, transport and labour. The question of how to induce some of the coloured races to work still remained unanswered, although it had received considerable attention ever since the abolition of slavery some sixty years ago.

"THE MAROONS OF JAMAICA."

(By H. T. THOMAS, Esq.)

SIR HENRY NORMAN presided on the 9th December at a lecture given at the Institute by Mr. H. T. THOMAS, Inspector of the Jamaica Constabulary, entitled "The Maroons of Jamaica." In his introductory remarks the chairman said, for the information of those of the audience who were not acquainted with Mr. Thomas, or who had not been present at the lecture given by him at the Institute a few weeks before, that the lecturer had been for twenty-three years an officer in the Jamaica Constabulary, that he was now at the head of the constabulary in the parish, or county, of St. Mary, a district covering about 230 square miles, that he had travelled in various parts of the island, and that he had paid particular attention to this somewhat curious people.

Only as recently as 1898 a considerable amount of space had, said Mr. Thomas, been devoted in one or two of the London papers to particulars of a disturbance, the importance of which, however, had been much exaggerated, created by the Maroons in the neighbourhood of the town of Annotto Bay on the north-west coast of Jamaica. The impression then created in this country—which corresponded in some measure to that obtaining in the island itself—was that the Maroons were a separate and distinct race of people, inhabiting the inaccessible forest regions of the mountainous interior of the island, and more or less independent of British rule—an impression which in many respects was quite inaccurate.

When the Spaniards settled in Jamaica, on its discovery by Columbus in 1494, they found it inhabited by a tribe of Arawak Indians, people of a gentle, peaceable disposition, living exclusively in settlements on the coast or its immediate neighbourhood, and subsisting, almost entirely, on fish, eked out with two or three kinds of vegetables, of which the chief was the cassava.

These Indians the Spaniards either exterminated outright, or enslaved and put to agriculture. In order to escape these alternatives the best and strongest of the aborigines left their settlements on the sea-shore and took refuge in the mountains of the interior, which hitherto they had never dared to penetrate. As the settlement and cultivation of the island proceeded, these Arawaks died out or escaped to the woods, and the Spaniards provided against the increasing demand for labourers by importing negro slaves from the West Coast of Africa, the strongest and most resolute of whom, in their turn, likewise escaped to the woods and joined the fugitive remnant of the Arawaks, whose numbers were thus constantly augmented by the very pick of the negro slaves from the plantations. The two races intermingled, and physical traces of this fusion persisted in certain individuals and families to the present day, although all the original Arawaks must have disappeared at least two centuries ago, while the element of negro blood constantly increased year by year and now completely preponderated.

The hair of the Indian was long and straight, and his complexion of a coppery red, while the negro's hair was short, crisp, and tightly curled, and his complexion black. In some of the blue-blooded families of this mixed race, at the present day, the skin was of a distinctly coppery tinge, and the hair, much longer than that of the ordinary negro, presented the appearance of having been highly frizzed.

This mixed people, being entirely cut off from such influences of civilisation as might have trickled to them from the Spaniards, and having no resources of their own in that direction, remained in a condition of savagery; indeed, it was beyond all question that the lower and more degraded African element among them by degrees introduced the practice of cannibalism, which was indulged in by them up to comparatively recent times. Also the African form of superstition known as obeah became practically their religion, and was believed in by them now to a greater extent than by the ordinary negro population.

In the years 1635 to 1637 the negroes, taking advantage of the military operations against the Spanish and British, abandoned the plantations wholesale, and joined the fugitives in the mountains in such numbers that together they became a serious menace to the English themselves; and it was possible that some of the more ambitious among them, men who had probably held exalted rank among their own tribes in Africa, had visions of a negro king being established in Jamaica by driving into the sea both the opposing nationalities of whites who were then contending for the possession of the island.

Mr. Thomas here gave an interesting account of the measures adopted by Major-General Sedgwick, the first administrator of the island, appointed by Cromwell, and of his successor D'Oyley, in subduing this people. Their subjection, however, was far from complete, and

considerable numbers of them remained irreconcilable; and these, from time to time, were augmented by runaways from the slaves whom the British, in their turn, began to import for the purposes of settling and cultivating the country.

It was about this time that the name Maroons first began to be definitely applied to this mixed race—a word said to be derived from the French “*Maron*” used by the buccaneers to describe fugitive negroes. As time went on they increased in numbers and confidence to such an extent that they occasionally raided the outlying sugar-plantations; and as cultivation increased, and plantations began to be carried further into the interior, each planter’s house had to be constructed in such a way as to be proof against the attacks of the Maroons. Arms and ammunition were provided, and guards were always in readiness; in fact every house, many of which were still in existence, was a small fortification, and had massive stone walls, loop-holes for musketry, and, in some cases, underground passages and vaults as places of refuge in case of emergency.

Altogether this turbulent people had from time to time been the cause of a good deal of trouble in the island, and much blood and treasure had been expended in contending against them—notably in 1734 and 1738, and again in 1795. This latter outbreak had been caused, Mr. Thomas considered, by the Government of the island in 1738 treating the insurgents, after their surrender, as an independent people instead of incorporating them with the rest of the population. The Government had made a treaty with them granting them—at that time merely a gang of depraved, ignorant African savages—numerous privileges which were not possessed by the great bulk of their countrymen throughout the island. Their mental and moral status was, if anything, lower than that of the slaves on the plantations, and very much lower than that of the free coloured people of the island; and yet they were encouraged to keep themselves apart from, and regard themselves as superior to, all of these.

A detailed account was given of the insurrection of 1795, the most formidable outbreak that had disturbed Jamaica during its existence of 250 years as a British Colony, and which resulted in the Maroons offering their submission. This was accepted on the condition that they resettled in the island as ordinary free negroes. As only a portion of them agreed to this, a large number, about 600 in all, were, in 1796, deported to Nova Scotia, but being unable to stand the climate there they were eventually transhipped to Sierra Leone, where their descendants might still be found.

This exodus did not include every individual Maroon in the island. Small bands of them still lurked here and there in the woods, and any runaway slave who joined them became, by virtue of that act, a Maroon himself; but they do not seem to have given the Government any further considerable trouble, and in the serious rising of slaves, which occurred in 1832, there was no record of the Maroons having been engaged either on the side of the slaves or as allies of the Government.

Churches and schools were established in their settlements, and a large number gradually merged into the ordinary population while nominally maintaining their status as a distinct body. After emancipation many of them settled in the towns and other parts of the country and took up ordinary occupations. In all parts of the island, at the present day, were to be found men following different callings, some in the police force, who claimed to be of Maroon blood.

The last occasion the Maroons had acted, and been recognised, as a distinct and homogeneous body was in the year 1865, when they had been called upon to assist, and did assist, in the suppression of an incipient revolt. After the events of that year the Constitution of the island had been surrendered and the country became a Crown Colony, an era of reform had then been inaugurated, the country opened up by good roads, education taken in hand, the public service entirely reorganised, and altogether an entirely new order of things instituted.

Under these conditions the anomalous element of the Maroons, as a separate and semi-independent tribe distinct from the rest of the population, had gradually disappeared. They themselves had intermarried with the rest of the people, and only those who resided in settlements affected to keep up the traditions of the past by occasionally making a show of asserting their former privileges, by claiming exemption from taxes, and now and then laying a claim to lands which they alleged to have been devised to them by the Government in the past. It was a claim of this sort that had caused the disturbance referred to at the beginning of the lecture.

The Maroons relied on the mystery with which they had been surrounded in the past, and the traditional awe with which they were regarded by all classes of the population of Jamaica, to aid them to achieve their ends by means of bluff. Mr. Thomas was of opinion that if they were given clearly to understand that they were regarded in precisely the same light as any other of the negroes of the island they would never press any of these demands.

Any difference that existed between them and the rest of the negro population was, he said, entirely in favour of the latter. A great number of the men still followed their favourite pursuit of hog hunting and selling the “*jerked*” meat in the markets. Instead of carrying loads perched on the top of the head like the ordinary negro, they rested them on their backs suspended by a rope passed round the fore part of the head, a method which had obvious advantages when travelling through dense forests.

Mr. Thomas gave an interesting account of some journeys he had made to former Maroon strongholds, notably to Nannytown, a spot round which a considerable amount of superstition had arisen, and which, according to tradition, it was impossible for a white man to visit and return unharmed. He also described an expedition undertaken in 1890 by the then Governor, Sir Henry Blake, to a Maroon settlement, which he had conducted; and in conclusion said that the day of the Maroons had passed, and their capacity for mischief, which had always been their prominent characteristic, was practically at an end, and the time was not far distant when the name of Maroon would be nothing more than a tradition and a legend of the darkest days of Jamaica.

“EXPERIENCES IN ASIA MINOR IN 1857-8.”

(By GENERAL RENOUD JAMES.)

(ANGLO-RUSSIAN LITERARY SOCIETY.)

At a meeting of the Anglo-Russian Literary Society on December 3, Colonel Sir Thomas Holdich, K.C.I.E., C.B., R.E., in the chair, General Renoud James read an interesting paper on his “*Experiences in Asia Minor in 1857 and '58*,” while engaged there with the Turco-Russian Boundary Commission under the Command of Colonel Simmons (now Field-Marshal Sir John Linton Simmons), under whose orders were also Lieutenants Gordon and Helsham Jones, with Doctor Woodfall in medical charge.

General James at once aroused the interest of his audience by a delightful description of his friend and fellow-officer Gordon, the future hero of Khartoum, who had been his companion at Woolwich, before Sevastopol, and on the Bessarabia Frontier Commission, and with whom he had continued in intimate personal relations until 1859, corresponding with him afterwards almost until his sad death. The lecturer remembered with pleasure how, as a young man, Gordon had combined unwearied devotion to duty with extraordinary energy in every action of his life. By his bright, merry manner he brought everyone, with whom he came in contact, under the immediate influence of his own enthusiasm. No doubt the stern events of after-life divested his manner of this invariable cheerfulness, and changed him into the self-contained taciturn man, wrapt in religious contemplation, which he became in the world’s estimation. But General James felt thankful that he could treasure him in his memory as he had himself known him. As an instance of Gordon’s untiring energy, the lecturer said that often at the close of a hard day, when the officers with him would retire to their tents to rest, he would go out with his gun and not return till dusk. At Kazar Abad,

one halting-place on the frontier line of march, Gordon displayed his characteristic fearlessness by attacking a mountain bear with his sword. On another occasion he very nearly lost his life whilst descending Mount Alagos, when, in order to make the descent more rapidly, he was reckless enough to slide down the steep snow-covered side of the mountain. After these pleasant reminiscences of Gordon, General James proceeded to give an account of the journey from Constantinople to Trebizond, followed by the long march through Erzerum and Kars to the frontier at Alexandropol, where the whole Commission assembled. It consisted (besides the English party) of the French Commissioner, M. Pelissier, with his assistant, M. Saillard; Baron Finot, the French Consul in the Caucasus; the Turkish Commissioner, Hussein Pasha; the Russian Commissioners, General Tchirikoff and Colonel Nanine; a large detachment of Black Sea Cossacks under Colonel Kratchetefski, and two topographical officers. The lecturer then dealt in detail with the journeys made by the Commission along the frontier line southwards from Alexandropol to the Ararat range, and northwards from Alexandropol, through Georgia, to Batoum. In Georgia General James rode through some of the most beautiful scenery which he had ever seen. The desolate grandeur of the Ararat mountains had given place to the most lovely hills, valleys and lakes, resembling those in the highlands of Bavaria, while the wealth of forest—virgin oaks, ashes, and beeches—was beyond comparison. That the mountain tracks were very dangerous and difficult to travel on may be realised from the fact that, on one occasion, as the caravan was picking its way slowly along a precipitous mountain path, a mule, carrying a load of valuable surveying instruments, lost his footing, and fell into the bed of a torrent some hundreds of feet below.

After the description of a visit to the interesting town of Tiflis, and a thrilling account of a rapid and dangerous journey in canoes down the Teorahson to the Black Sea, General James concluded his interesting address by dwelling upon the great superiority of Russian over Turkish civilization in Asia. During his travels he had always preferred to be on the Russian side of the frontier. He believed that by this time the territory acquired by Russia in 1878 had advanced in every possible way. If it had remained in Turkish hands stagnation would have, as usual, been the result.

Colonel Helsham Jones, who had been a member of the Commission in 1857 and '58, spoke in high terms of Sir William Fenwick Williams and the officers who had so ably helped him in his defence of Kars; mentioning, also, the noble conduct of General Mouraviev on the surrender of the fortress.

Colonel Hamilton Vetch, C.B., and others, expressed their appreciation of the instructive paper just read. Mr. Cazalet said that he had travelled, in 1859, when the Russians captured the Circassian Chief Shanyl, through most of the places referred to by the lecturer. He also read a post-card written to him by General Gordon from Khartoum a year before his death.

Sir Thomas Holdich made some very interesting remarks with regard to Russia’s policy towards Turkey, and the Russo-Turkish boundary question, in the course of which he said that although he was not one of those who thought that England had everything to learn from foreign countries, and nothing to teach them—quite the contrary—he, nevertheless, thought that, in the matter of geographical surveying, we might take a lesson from Russia. For instance, we seemed to imagine that a few trained officers and untrained assistants were enough to cope with the whole area of South African mapping, and thus it was that we never seemed able to get our information till the critical time had arrived, and when it was most needed. Russia’s policy in this respect was very different.

PROCEEDINGS OF INSTITUTIONS.

THE LONDON CHAMBER OF COMMERCE.

At the third monthly dinner of the present session of this Chamber, held on the 15th ult., the subject for discussion was “*British Commercial Interests in Japan*.” Sir VINCENT KENNETT-BARRINGTON presided. In the course of the discussion Mr. J. H. LONGFORD, British Consul at Nagasaki, said that it had unfortunately been the custom in late years in England to overlook the great interest which we already had in Japan’s foreign trade, in the contemplation of the possible share which we might have in the future in a greatly developed trade with China. But that time was still remote. Japan’s foreign trade now exceeded in annual value £50,000,000. Her import of Western goods was over £19,000,000. Her imports from Great Britain exceeded £7,250,000, and from British dependencies, India, Hong Kong, and Australia, £3,750,000. So long ago as 1894 the two Japanese ports of Yokohama and Kobe had already become, next to Shanghai, incomparably the greatest seats of direct foreign trade, north of Hong Kong, in the Far East; and the imports in that year of the port of Kobe alone, which were very largely of British or British-Indian origin, exceeded in value the aggregate of those of the five principal ports in China, exclusive of Shanghai. The ratio of commercial progress between the countries had since been largely intensified. The commercial advance of Japan, the increase within the short space of ten years, not only in foreign trade, but in domestic industrial activity, had been no less marked than the display which she had given of her naval and military efficiency, and the fairest prospects existed that the results attained might be dwarfed into insignificance in the future. There was no likelihood of any diminution, either in the desire of her people to obtain from abroad what was becoming necessary to their comfort and well-being, or in their ability and willingness to pay for it. It was in manufactured goods that we in England were most interested. The import of woollen piece-goods, in which we found our principal competitor in Germany, would probably continue to increase. The home supply of cotton yarn, and, perhaps, also piece-goods, might become greater in Japan; but in all metal manufactures, in machinery of every description, especially spinning, weaving, printing, and sugar refining, in electrical appliances of all kinds, in locomotives, in all railway appliances, in all appliances necessary for the construction and maintenance of waterworks, in bridges, in steam boilers, steamers, sewing machines, pumps, fire-engines, and arms and munitions of war, he believed that, for very many years to come, there would be in Japan a steadily growing market well worthy of the most attentive cultivation in every respect. He could not now regard Germany’s competition, either in Japan or Corea, as a factor which need be viewed with any extravagant alarm by our manufacturers.

But very recently another rival had appeared on the scene, the United States; whose fiscal policy enabled the American manufacturer, who was geographically nearer to Japan and China than we were, to sell his goods to advantage at home, and thus console him for small profits or even occasional loss on the surplus sent abroad. American workmen were superior to our own in intelligence, ambition, education, mechanical ingenuity, energy, and desire to excel. Strikes were not unknown among them, but they were not heard of against the introduction of labour-saving machinery, which the American workman recognized must tend in the long run to his own betterment, while the manufacturer himself was bound by no rigidly conservative adherence to methods and traditions of the past or to established standards. He recognized that the seller must seek the buyer and meet his wishes, and that it was not the buyer who must take what the seller desired to provide. It used to be the custom to inscribe in large letters Nelson’s historic signal on the quarter-decks of all His Majesty’s battleships. That custom might now be imitated not only in every chamber of commerce in the United Kingdom, but in every factory and workshop, by inscribing prominently on their walls the Prince of Wales’s warning, “*The old country must wake up*.” Unless this were the case as regards both master and man, we should fail not only to advance, but even to maintain the position in Far Eastern trade which we still had.

As to the prospects of Japan as a market for the future, we could only judge by the history of the advance which she had made in the past, to which Mr. Longford proceeded to call

attention. He thought we might hope to hold our own with Germany, but, unless a radical change were made in our methods, he could not feel so sanguine with regard to the United States. Japan had herself evinced, and continued to evince, the strongest desire to cultivate closer commercial relations with us. She was now extending her consular system, and making many appointments of competent officers in our colonies with the avowed intention of fostering and extending trade. She was attached to us by strong political ties, and, what was more important in business, she recognized that everything we sold to her was of the best. An international exhibition, the first to be held, would be opened next year in Osaka, the Manchester of Japan. This would afford an opportunity which, he trusted, would be fully taken advantage of by our manufacturers to show their productions side by side with those of their rivals and to be represented during the continuance of the exhibition by qualified experts, who could, in the most favourable circumstances, investigate the prospects on the spot for themselves.

Mr. ARCHIBALD COLQUHOUN stated that during his wanderings in the Far East in the past twenty years he had made no fewer than five visits to Japan, and he had been struck on each occasion with the remarkable progress she had made. In many respects, embracing, indeed, almost everything of any real consequence, there was a complete identity of interests between Japan and this country, and recent events—the development, commercially and industrially, of Japan, and, still more, perhaps, the evolution, now proceeding in Japan, of her sea-power—had made that similarity still closer. He felt convinced that the Pacific Ocean was going to be the arena of the coming struggle of the 20th century. The struggle would not, he believed, be territorial in its chief features, but commercial and naval, and it would, he thought, centre about the great trade routes which already were beginning to revolutionize the whole history of the Pacific. In this coming struggle Japan must play no inconsiderable part, and must be our rival, but he believed we should find in her a friendly rival; and, in connection with it, he looked with entire confidence to a still closer bond between the two countries.

THE SOCIETY OF ARTS.

At a meeting of the Indian section of the Society, held on the 5th December, a paper was read by Mr. E. Penton on the new trade route to Persia by Nushki and Seistan. The chair was taken by Sir H. DRUMMOND WOLFE.

In the course of his paper Mr. Penton remarked that the trade of Persia had hitherto been controlled through three main entries—namely, through Caucasia and Transcaspia in the north, and through the Persian Gulf in the south. The two northern entries were entirely under the control of Russia, while England had always been a predominant Power in the Persian Gulf. If, however, the Eastern markets required English goods they had to be carried by caravan across the Dashtidut. This placed goods entering Persia from Askabad, which was only 150 miles from Meshed, in a predominant position in Khorassan, which had for centuries been one of the richest provinces of Persia. It was this country which the Nushki-Seistan route was to feed with Anglo-Indian goods. The Indian railways only reached as far as Quetta, from which place Nushki was 96 miles distant, and though the country between these two places had been surveyed, at present all caravans must start from Quetta in order to be in communication with the railway.

It was generally believed in India that the country between Nushki and Seistan was an absolute desert. The more correct description would be an unfertile country. The camel-grazing was excellent for the whole of the way, and only once did he reach a place where there was not sufficient scrub to make a fire. The journey in no way presented the difficulty it was generally supposed to present. Robat was the last British post, and the distance was accomplished in 18 marches—five to Dalbindin, three to Merui, and ten to Robat. As far as Dalbindin the water supply was excellent, and sweet water was obtainable on the present route to Merui. Between Nushki and Dalbindin mud bungalows were being erected at every stage, but from Dalbindin onwards accommodation could only be found in the thanas, or small forts, except at Merui and Robat, where bungalows were already built. From Robat to the Kuh-i-malik Siah, the point of junction of Baluchistan, Afghanistan, and Persia, was only half a march. The value of this post as a strategic position could not be over-estimated.

From Robat five marches brought the caravan to Pushtee Das, and from thence a difficult journey was made to Nasirabad, where a British Consulate was first established in January, 1899, by Colonel Trench. From Nasirabad the route lay to Birjand, from thence to Meshed. On this latter section the expedition passed through the most fertile country yet seen, villages full of orchards rich with fruit being passed on the way.

The bazaar at Meshed was found to be full of Russian goods, a fact which was not surprising, seeing that the distance between Meshed and Askabad, from which place there was direct communication with Europe, was only 150 miles. In addition to this advantage Russia gave large bounties to her subjects in Persia, which not only covered the cost of freight, but left a little profit for the merchant besides. The only British business interests were at present represented by a branch of the Imperial Bank of Persia, a wool buyer for a large firm; but he had every reason to believe we were rapidly gaining influence in the town.

With the institution of this route we had a channel through which our goods could pass with ease into Eastern Persia, and if we placed a firm foot at Robat we should be in a position to demand a share in any railway concessions in Persia that might be given to Russia, which would enable our trade to hold its own in that country. If, on the other hand, Russia were allowed to develop Persia alone, our position in the East would assuredly be in danger.

The Chairman, in opening a discussion which followed, said that all would agree that nothing would so conduce to the interest of the Indian Empire, and of the British Empire also, as the securing of constant peace in Persia. They saw great advances on the part of Russia in the markets of that country, and he only hoped we should be able to enter into harmonious relations with her so that there might be room for us as well in Persia as in Asia generally. He could not help thinking it would be futile on our part to endeavour to prevent other countries sharing in the trade of Persia. We should not oppose the making of railways in that country, but we should take care that we had a full share in their construction and in their control and management. Nothing was more desirable than to make Persia a bulwark, and he did not see why she should not become a sort of Oriental Belgium.

Sir T. Holdich, dealing with the suggested railway extension from Quetta to Nushki, said that Nushki formed a far more convenient terminus for traffic from the west, and the establishment of a line between Quetta and Nushki would deal with the most difficult section of the not very difficult line which would connect Quetta with Karachi in the south; and, if it so happened hereafter, as he thought it would, that England would see the advantages as well as the disadvantages of direct communication between the Khusk port and Herat, all the system of the south would work admirably into the connection.

Major Sykes said he had visited Seistan two years ago to found a Consulate, and he was much struck with the progress made since that time. He thought the Government of India was much to be congratulated on the progress made.

Sir Lepel Griffin thought that it should not be forgotten that, when Meshed was reached, an *impasse* was formed by the Russian frontier, which was only a very short distance to the north. The Russian tariff was so exclusive that it was very difficult for British goods to enter Russia at all, and he did not think there was a very large demand for them in that part of Persia referred to, as it was very thinly peopled. With regard to the question of opening routes into Persian territory, it must not be forgotten that our real entry into that country, and the real centre of British influence and trade, was the Persian Gulf. The preponderance of England in the Gulf had been the cardinal point of British policy during the whole of the last century. The Gulf was the key-note, so far as England was concerned, and it would be a great disadvantage to England if it was occupied by any one else.

COMMERCIAL INTELLIGENCE DEPARTMENT.

CORRESPONDENCE AND ENQUIRIES.

The following are given as specimens of some of the enquiries which have been addressed to, and satisfactorily answered by, the Institute during the past month (January).

** * All communications must be authenticated by the name and address of the writer. Enquiries which would involve special applications or expense will be a matter of arrangement with the correspondent.*

- J. C. C., London.—Lemon grass oil.
- R. S. P., Alnwick.—General information on Selangor.
- H. D., Huddersfield.—Briar pipe manufacturers.
- J. S., Edinburgh.—General information on Victoria, Queensland and New South Wales.
- Verbal.—Fruit cultivation in Jamaica.
- „ Import Duties of Bermuda.
- „ Kauri-pine wood.
- „ Customs Tariffs of Spain, Portugal, etc.

REQUIREMENTS REGISTRY.

In order to provide correspondents with an opportunity of making known special “wants” or “needs” in the British Colonies, India, and Foreign Countries, space will be regularly devoted to the publication of approved notices in the IMPERIAL INSTITUTE JOURNAL. Notices, as a rule, should not exceed 25 words in length, for which a charge of 2s. 6d. will be made for each insertion. Special arrangements can be made for longer notices.

SPECIMENS OF FOREIGN AND COLONIAL WOODS desired. Purchase or exchange. Names and localities must be well authenticated. Address—HERBERT STONE, BRACEBRIDGE-STREET, BIRMINGHAM.

THE CURATOR OF THE CANADIAN SECTION OF THE IMPERIAL INSTITUTE is prepared to furnish information about Canadian Trade and to supply names of importers, manufacturers, shippers, etc.

The following trade enquiries have been received at the Canadian Section of the Imperial Institute, from the Curator of which Section further particulars may be obtained:—

Home Enquiries.—A manufacturing company in a position to take considerable supplies of veneer which is impervious to moisture, would like to hear from Canadian firms which can furnish the material.

Enquiry is made for the names of Canadian manufacturers of wood flooring who are engaged in the export trade, and can quote upon specification.

A company manufacturing pumps and pumping machinery is prepared to appoint a responsible Canadian firm to act as its agents for the Dominion.

A Scotch firm desires names of Canadian producers of canned vegetables, fruits, etc.

A West of England firm seeks reliable Canadian agents to take up sale of stationery, novelties, guns, glues, window glass, etc.

A company manufacturing spring beds would like to hear from Canadian firms who can supply pitch pine frames for same in “knock-down condition.”

A broker and commission agent, possessing a good connection, is prepared to act as selling agent for first-class Canadian firm of packers wishing to develop export trade in canned goods.

An enquiry has been received from the north of England for the addresses of Canadian manufacturers of carriages, etc.

A London house wishes to be placed in communication with Canadian firms who can supply railway sleepers suitable to the requirements of tropical countries.

Canadian Enquiries.—A Montreal firm of importers and manufacturers whose travellers visit the principal centres, would like to secure the agency of a manufacturer of metallic capsules for bottles, etc., not already represented in Canada.

A British Columbia correspondent desires names of United Kingdom houses who can supply jam making machinery and appliances and glass jars.

A Canadian manufacturer of finished lasts of all kinds for the boot and shoe industry asks to be placed in communication with a United Kingdom firm of good standing prepared to do business in these classes of goods.

A Toronto firm of dry goods commission agents of ten years' standing seeks a few additional agencies in woollens, underwear, cottons, and similar goods.

MAPS AND CHARTS.—RECORDS.

[The entire collection of maps (with the exception of a few atlases and maps issued by private firms) consists of authoritative publications of the various government cartographical departments. Such as: the One-inch Ordnance Survey of Great Britain and Ireland, a complete set of Admiralty Charts, and a selection from the maps compiled in the Intelligence Division of the War Office; the monumental “Indian Atlas,” and a large number of the publications of the Surveyor-General's Office, Calcutta; the Geological Survey of Canada, and the Government Surveys of Victoria and New South Wales. In the arrangement of the collection, the geographical classification of the War Office Intelligence Department catalogue has, with some modifications, been followed.]

ADDITIONS TO THE COLLECTION OF MAPS DURING JANUARY, 1902.

AFRICA.

Egypt.

SUDAN. Sheets of Intelligence Division Map:—Atbara, Beni-Shangul, Fazogli, Keili, Shabluka and Shendi.

Presented by the Director-General of Mobilization and Military Intelligence.

CEYLON.

The annual Colonial Office report on the island of Ceylon shows that the revenue for 1900 amounted to Rs.27,325,930.56, compared with Rs.25,913,141.58 in 1899, showing an excess of Rs.1,412,788.98. The estimated revenue was exceeded by Rs.2,205,930.56. The revenue in 1850 amounted to about one-fourth of the receipts of the year 1900. The expenditure for 1900 was Rs.28,948,927.17, including Rs.3,626,939.17 on account of railway construction debited to surplus funds, and exceeded the expenditure of 1899 by Rs.3,997,986.81. The imports for the year were valued at Rs.114,544,256, as against Rs.101,542,220 in 1899, while the exports were valued at Rs.108,926,256, a decrease on the previous year, mainly attributed to the smaller shipments of plumbago. The export of tea increased by 20,000,000 lb., and reached 149,264,602 lb., valued at Rs.53,735,257. The shipping returns show a decrease of 1,335 in the number of vessels entered and cleared, but an increase of 1,048,735 in the tonnage.

The estimated population of the island on December 31, 1900, was 3,612,303. 136,051 births were registered and 100,873 deaths. The birth-rate was 38.2 against 38.0, and the death-rate 28.3 against 30.2 per 1,000 in the previous year, calculated on the estimated population at the middle of the year. Both birth and death rates show an improvement, and the estimated population exceeded that of 1899 by 123,000. Post office, telegraph, and savings bank business shows gratifying increases. The report refers to the participation of the colony in the South African war, and also gives particulars of the camps for the accommodation of 4,500 Boer prisoners.

Regarding openings for capital in Ceylon the report is somewhat pessimistic as to the plumbago and tea industries, but states that cocoanut cultivation is thriving, and that minor products, such as cacao and cardamons, are profitable. The last paragraph of the report deals with the social condition of the people, and draws attention to the small demands made on the Ceylon native's income in the way of taxes.

NEW BOOKS, etc.

CHARLES GRIFFIN AND CO., LIMITED. (London, 1901.) *Handbook on Petroleum for Inspectors under the Petroleum Acts.* By Captain J. H. THOMSON, H.M. Chief Inspector of Explosives, and ROBERTON REDWOOD, Adviser on Petroleum to the Home Office. La. 8vo., pp. xix + 298. (Price, 8s. 6d.) Mr. Robertson Redwood is well known as an expert on petroleum, and his exhaustive treatise on the subject is regarded as a standard authority. The present volume is intended for the use of inspectors under the Petroleum Acts, and also for those engaged in the petroleum trade as carriers, storers, or distributors, and those who employ petroleum in industrial operations or as a source of power. It contains information respecting the geographical and geological occurrence of petroleum, and its production and refining, which will be found most useful to those engaged in the trade, as well as to the local authorities. The numerous commercial products of petroleum, shale-oil and coal tar are described, as well as the flash-point, fire-test, etc. The past and existing legislation relating to petroleum is fully stated, the Acts and Forms of Licence in force being given in Appendices for convenience of reference. With a view to lessen the risks in handling and storing petroleum, the necessary precautions to be taken are clearly indicated, and if these safeguards were adopted, further legislative control would be unnecessary. Suggestions are also offered as to the construction and use of mineral oil lamps, which, if carried into effect, would render accidents from such lamps of rare occurrence. Though it is mentioned that this Handbook is in no sense official, yet the particulars it contains respecting the use of petroleum and of carbide of calcium and acetylene will be found most reliable and of the utmost value to all who are connected with these industries.

THE PROPRIETORS OF THE "IRON TRADE CIRCULAR (RYLAND'S)." (Birmingham, 1901.) *Ryland's List of Merchant Exporters*, being actual buyers of Iron, Steel, Tin-plates, Metals, Hardware, and Machinery, 1901. Fifth Edition. La. 8vo., pp. 197. (Price 10s. 6d.) This useful List has reached a fifth edition, and has been thoroughly tested by experienced persons connected with the iron, steel, tin-plate and hardware trades. It will be found invaluable to advertisers who make or supply the raw materials or who manufacture hardware. As a handy book of reference it can be well recommended.

The Imperial Colonist, edited by Lady KNIGHTLEY of FAWLEY, is a new publication issued by the BRITISH WOMEN'S EMIGRATION ASSOCIATION and the SOUTH AFRICAN EXPANSION COMMITTEE. It provides information as to openings in the Colonies for women as Teachers, Governesses, Trained Nurses, Mothers' Helps, Typists, Dressmakers, and Assistants in Business, and Domestic work; also particulars of Dairy-, Poultry-, Vegetable- and Fruit-Farming, or other business for those with small capital. The dates of sailings to the Colonies, cost of passage, etc., will be regularly announced. The *Journal* will be issued on the 1st of each month, at the small price of 2d., and it will be found most useful by British women who propose settling in any of the Colonies. It is probable that the information will soon be in considerable request, as emigration is rapidly increasing. Copies may be obtained at the British Women's Emigration Office, Imperial Institute. Annual Subscription 2s. 6d. post free.

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- Commercial Periodicals of the principal Colonies and of India;
- Market reports, prices-current, and statistics.

2. An Enquiry Office, in telephonic communication with the Commercial Information Office of the Imperial Institute at South Kensington. Enquiries relating to industrial, commercial, and other matters connected with the Colonies, India, and Foreign Countries, are received and promptly dealt with, and samples of products from the Colonies and India, stored at the Imperial Institute, can be inspected or obtained. Expert valuation will be furnished of samples submitted for that purpose.

3. The News Room is *free to Fellows* of the Institute, as is also the Enquiry Office for obtaining such information as does not involve special research or correspondence.

4. A *subscription* of the sum of one pound per annum, payable in advance, secures the *free use* of the News Room, and the supply, free of charge, of information not involving special research or correspondence.

5. Subscribers of one pound per annum are also entitled to inspect, *free of charge*, any maps or charts included in the Map Room collection at the Imperial Institute, South Kensington, and to consult any works, or official papers, included in the Institute Library. Passes admitting to the Library or the Map Room for the foregoing purposes will be issued, as required, on application to the Clerk at the City Office.

6. *Non-Subscribers* to the City Branch can be supplied with information upon the following terms:—

- First* enquiry, not involving special research or correspondence, *free*.
- For each subsequent enquiry, not involving special research or correspondence, one shilling.
- For each enquiry, involving special correspondence, or interviews with home-experts, etc., five shillings.
- For each enquiry involving Colonial or Foreign correspondence, ten shillings; or by special arrangement, if likely to be voluminous.

7. *Subscribers* will have to pay the charges specified under (c) and (d) in the foregoing clause: *Fellows* will only be required to reimburse the Institute any out-of-pocket expenses incurred in connection with enquiries coming under those heads.

8. The Information Department will undertake to obtain analytical or other examinations of samples by competent Experts, upon payment, by persons submitting them, of the usual professional fees, to be previously specified, and agreed to by the applicant.

9. The Institute will undertake to procure, and supply, at cost price, translations into any language, of trade circulars, prices-current, etc., and the conversion of weights, measures, coinages, etc.

SCHOOL OF MODERN ORIENTAL STUDIES.

Founded by the Imperial Institute in union with University College and King's College, London.

In 1887 it was suggested that a school of Modern Oriental Studies should be organised as a branch of the Institute, in imitation of the very efficient establishments of this kind which are carried on, with Government resources, in France, Germany, and Austria. The promulgation of this proposal led to negotiations with the authorities of University College and King's College, London, which resulted in their co-operation with the Institute in the establishment of the School. A Special Committee having been appointed to decide upon a system of work, it was arranged that classes for instruction in the Oriental languages required by students qualifying for examinations for the Indian Civil Service, should be held at University College, while modern Oriental languages, other than the Indian languages, should be taught at King's College, and that the Imperial Institute should undertake the general administrative and financial work. The School was officially opened in January, 1890, when an inaugural address was delivered by Professor Max Müller at the Royal Institution, in the presence of His Royal Highness the Prince of Wales. The daughters of the late Colonel W. J. Ouseley (Bengal Army) have established and endowed, in his memory, three scholarships, in Arabic, Persian, Hindustani, and other Oriental languages, in connection with the School, each one of the value of not less than £50 per annum. The following Scholarships have already been awarded:—

YEAR.	SUBJECT.	EXAMINERS.	AWARDED TO.
1892	Arabic .	{ Dr. WELLS Prof. SALMONÉ	<i>No Competitors.</i>
1893	Arabic .	{ Dr. WELLS Mr. JOHN T. PLATTS	Mr. HENRY LEITNER, junr.
"	Persian .	{ MIRZA HUSSEIN KULI KHAN Mr. JOHN T. PLATTS	Mr. E. DENISON ROSS.
1894	Hindustani .	Mr. JOHN T. PLATTS	<i>No Competitors.</i>
"	Persian .	Dr. ROBERT BRUCE	Mr. DIWÂN TEK CHAND.
"	Chinese .	Sir THOMAS WADE	<i>No Competitors.</i>
1895	Turkish .	Dr. WELLS	Mr. L. STENNETT AMERY.
"	Hindustani .	Mr. J. T. PLATTS	Mr. ASGHAR ALI.
"	Chinese .	Gen. R. D. ARDAGH	<i>No Competitors.</i>
1896	Burmese .	Dr. WELLS	Mr. LEE AH YAIN.
"	Arabic .	Mr. J. W. NEILL	Mr. H. G. SARWAR.
"	Marathi .	Dr. S. A. KAPADIA	Mr. V. R. PANDIT.
1897	Gujarati .	Mr. J. T. PLATTS	Mr. RUSTUM D. N. WADIA.
"	Persian .	Mr. W. A. PICKERING, C.M.G.	Mr. P. S. PATUCK.
"	Chinese .	Prof. J. F. BLUMHARDT	<i>No award.</i>
1898	Bengali .	Dr. WELLS	Mr. B. C. GHOSH.
"	Turkish .	Dr. WELLS	Lieut. A. M. SETON, R.A.
"	Chinese .	Dr. WELLS	<i>No Competitors.</i>
1899	Arabic .	Dr. WELLS	Mr. G. A. KHAN.
"	Persian .	Dr. ROSS	Mr. R. M. DAVIS.
"	Sanskrit .	Prof. C. BENDALL	Mr. S. K. GHOSE.
1900	Hindustani .	Mr. J. T. PLATTS	Mr. N. HAGOPIAN.
1901	Marathi .	Prof. J. W. NEILL	Mr. J. R. MARTIN.

An OUSELEY SCHOLARSHIP of £50, tenable for two years, will be awarded this year, should sufficient merit be shown, for proficiency in PERSIAN. *No person will be admitted to competition for a Scholarship in a language which is his own mother tongue, nor for a Scholarship in a language allied to his mother tongue.*

The examination takes place early in July, 1902.

Competitors must give notice on or before July 1, 1902.

The ages of Candidates are to be above 17 and under 25 years on January 1 of the year of examination.

Further particulars may be obtained from the Secretary, S.M.O.S., Imperial Institute, S.W.

GENERAL INFORMATION FOR INTENDING STUDENTS AT THE SCHOOL.

The classes which the "School of Modern Oriental Studies" comprises, are divided under two heads. DIVISION I. includes classes for all Oriental Languages especially required by Students qualifying for examinations for the Indian Civil Service, the instruction being of the same character as that provided for some time past at University College and at King's College. This Division includes instruction in Sanskrit, Bengali, Hindi, Hindustani, Tamil, Telugu, Punjabi, Pali, Marathi, Gujarati, Arabic, and Persian.

DIVISION II consists mainly of classes for Modern Oriental Languages other than the Indian Languages. The courses of tuition are of a practical rather than of an academic character; they have particular reference to commercial and official requirements and to the facilitation of colloquial intercourse with natives of Oriental Countries.

It is in contemplation, so soon as the number of students warrants the expenditure, to secure the services of native readers and teachers of conversation in connection with the classes of this Division.

The classes under this Division are conducted at King's College, where arrangements will also be made for the establishment of evening classes.

The Languages taught in Division II. comprise Colloquial Arabic, Armenian, Modern Greek, Colloquial, Persian, Russian, Turkish, Chinese, Burmese, Japanese, Malay, and Swahili.

Arrangements have been completed by the Managing Committee and approved of by the Governing Bodies of the Imperial Institute and of the two Colleges, for the pursuit of studies relating to the history, literature, commercial and physical geography, political economy, and the natural and industrial resources, of the countries and districts in which the various languages are used.

Special Lectures or courses of Lectures will be delivered from time to time, in connection with the School by experts or specialists, in any of the foregoing subjects.

There are three terms, of about ten weeks, in each year, as follows:—

SPRING TERM—commencing about the middle of January.

SUMMER TERM—commencing early in May.

AUTUMN TERM—commencing about the middle of October.

A fee of THREE GUINEAS per term will have to be paid, in advance, by each Student for each Language taken up for instruction. This payment will entitle the Student to the use, within the College, of text books, dictionaries, and works of reference required in connection with the particular Language taught, and to the use of all the facilities which it is proposed to secure in the development of the School.

Accommodation is provided at the Imperial Institute to enable Students to pursue their studies at hours when the classes are not held. The Libraries of both Colleges will be open to Students in any of the classes of the School, during the usual hours of study.

Intending Students should communicate with the Secretary at the offices of the Imperial Institute, London, S.W., where the registration of Students will take place, and where all information regarding the School will be supplied.

Balata in Dutch Guiana.—The balata industry in Dutch Guiana is flourishing, the revenues from concession fees for these have amounted to £800 in 1900. Not less than 14,820,000 acres were applied for the purpose of testing the presence of balata, and concessions have been granted for 395,200 acres. The growing request for this article, and the higher prices obtained in the market, are the reason for it. In time balata may take the place of caoutchouc in some manufactures. The chief export of balata goes to the United States and to Great Britain. Through the severe bye-laws prohibiting the felling of balata trees in Surinam, a decrease of the trees will very probably be prevented, although a control is very difficult. This is mostly done through journeys of policemen, especially in the district of Nickerie. On the 17th of January, 1901, the governor published the conditions according to which, in future, four month concessions for ascertaining the presence of balata will be granted free of charge. Its wording is as follows:—(a) No exploitation must take place; (b) The expeditions must consist of a foreman and six workers for every 123,500 acres, or part of it; (c) Within three weeks from the day of granting concession a certificate must be sent to the police at the Government-Secretary, that the persons named are engaged by contract, and one month after the granting of concession another certificate that the expedition is on its way; (d) The concession will at once be cancelled if the respective papers are not sent in properly in the time mentioned under (c); (e) If it is furthermore evident that the company does not carefully follow the conditions under (b) and (c), or tries to avoid them, if laws regarding public order, safety or health are not respected, or if an exploitation on a ground takes place that is only granted for trying. These conditions have been issued because, lately, exploitations took place repeatedly, when only a trial was allowed, and because often large areas have been allowed for trying without charge, when no trying has taken place at all. The reason for obtaining concessions in these cases was only to prevent others from getting concessions.—*The India Rubber and Gutta Percha Trades' Journal.*

MONTHLY COMMERCIAL AND INDUSTRIAL SUMMARIES.

GENERAL COMMERCE AND INDUSTRY. COLONIES.

Australia.—GLOVE TRADE.—The French Chamber of Commerce at Sydney calls attention to the vast consumption of gloves in Australia. The demand for gentlemen's gloves is but small, as large purchases are effected only of glacé and driving gloves, while of ladies' gloves great quantities are sold. The wearing of gloves is customary in all classes, including servants and workmen, and the heat in Australia causes gloves to become useless after having been worn several times, so that the consumption is very considerable. The best liked are four-button kid and suède gloves, which sell at 3s. to 4s. retail. Light shades sell best. There is a strong demand, especially during the summer, for white gloves at the retail price of 3s. 6d., but this article meets with the growing competition of the white silk glove at 1s. 6d. to 2s. the pair. New South Wales alone imported in 1899 gloves of the value of £89,855, the greatest portion of which was supplied *via* London. The total value of gloves imported annually into Australia probably exceeds £320,000.

British Columbia.—MINERAL PRODUCTION.—A bulletin issued by the Minister of Mines estimates the value of the mineral production of British Columbia in 1901 at \$20,713,501, being an increase of 25 per cent. over the previous year. The lode mines show an increase over 1900 of 57 per cent.

British East Africa.—OPENINGS FOR TRADE.—The British Sub-commissioner for the province of Ukamba, British East Africa, reports that with regard to the present system of trading there, nearly all the local trade—that is, any trade within four or five miles of the railway—is brought into the bazaars, but to places further afield caravans proceed as in the past. The principal goods required by the natives are as follows: Gray cloths, American and Gumpity; black and dark blue cloths, Kaniki; Turkey red, Bendera; flannel shirts, fez caps, umbrellas; cheap blankets, but must be wool; military and police coats, copper wire, brass wire and fancy beads. Locally, rupees and pice will purchase anything there is for sale. The money eventually finds its way into the bazaar, and the trade goods required or fancied by the natives are purchased. Nearly all the retail trade with the natives is in the hands of the East Indians and a few Greeks.

Canada.—MINERAL PRODUCTION.—The Dominion Statistician (Mr. George Johnston) has just completed a report, from which it appears that Canada's yield of minerals last year was only one-seventeenth of that of the United States, but this represented a value of \$12. 6c. per head of the population, compared with \$14. 3c. per head in the United States. Canada's increase per head in the decennial period 1891 to 1901 was a fraction short of double that of the United States, being \$8. 14c. per head, against \$4. 11c. per head for the United States; the Dominion Statistician remarks that it will not take long for Canada to catch up and pass the United States.

Gold represents the largest part of the increase in Canada. In 1891 the gold produced in the Dominion was only \$1,500,000, whereas last year it was \$27,908,000. In the United States the yield of gold last year was one-seventh of the entire metallic production, whilst in Canada it amounted to five-sevenths. Since Canada commenced producing gold she has added 136½ million dollars worth to the world's store of the yellow metal. Of this over 52 millions came from the Canadian Yukon gold-fields.

The metallic products of Canada chiefly comprise gold, silver, lead, nickel, copper, zinc, and pig iron; whilst in the United States, besides these, there are produced quicksilver, antimony, platinum, and aluminium, which do not appear in the Canadian returns. Antimony is found in one province of Canada, Nova Scotia, and was at one time produced to a small extent, but a lawsuit stopped operations. Aluminium, although not yet produced in Canada, exists in deposits to the extent of millions of tons. Canada also has corundum, but it is too valuable for its abrasive powers to be used to provide aluminium. The production of corundum is this year being undertaken in Canada on a somewhat extensive scale. Next to pig iron in importance in the United States is copper. The value of its copper output last year exceeded that of its gold by nineteen million dollars. In Canada the output of copper is trifling compared with that of the United States, only amounting to a little over three million dollars (\$3,063,119) last year, compared with upwards of 98 millions (\$98,494,039) in the United States. Copper mining companies are now in existence in Canada, however, having an authorised capital exceeding 140 million dollars, only a small proportion of which has so far been actually employed. Eight of these companies—namely, four in Ontario, two in Quebec, and one each in Nova Scotia and New Brunswick—are working mines of copper and pyrites; six companies, all in Ontario, copper and nickel; 32, in British Columbia, gold and copper. In nickel, Canada outstrips the United States and all other countries.

The non-metallic division of the mineral wealth of the United States and Canada comprises fuels, structural materials, abrasive materials, chemical materials, pigments, and what one may term "miscellaneous." The fuels include coal, natural gas, and petroleum. In these, as in the metallic division, Canada is gaining rapidly on the United States. The products of the latter country were 34 times greater than that of Canada in 1890, but fell to 27 times greater in 1900. The increase in that period in the United States was 75.9 per cent. and in Canada 120.7 per cent. In structural materials such as stone, tiles, clay for brick and cement, Canada's increase in the same period was 67 per cent., against 19 per cent. in the United States. Canada (Ontario), says Mr. Johnston, is unique in that it is the only maker of arsenic on the continent. Last year the Canadian Goldfields Company, Limited, produced 606,000 pounds of arsenic, of an estimated value of \$22,725, as a by-product of their gold-milling operations.

Straits Settlements.—COCOANUT AND ITS PRODUCTS.—During the calendar year 1900, there was imported into the Settlements 93,074,933½ lb. of copra, the import value of which was \$4,455,489 Mexican. During the same year there was exported 91,160,026½ lb. of copra, valued at \$4,416,937 Mexican. Of cocoanut oil, there was imported during 1900, 10,105,733½ lb., the import value of which was \$1,011,679 Mexican. The export was 14,749,553½ lb., the value of which was \$1,500,910 Mexican. Imports of cocoanuts amounted in 1900 to \$21,409 in Mexican currency, and the export to \$311,773 Mexican, showing a large local production. Of vegetable tallow, imports during the year 1900 amounted to 52,533½ lb., valued at \$7,034 Mexican, while exports amounted to 91,900 lb., valued at \$37,948 Mexican. About 60 per cent. of these imports came from Japan, and the remainder from Burma; all was exported to Great Britain.

Tasmania.—TIMBERS.—Tasmanian timber, admitted by experts as among the best in the world, finds but scant place in

the world's market. The *Tasmanian Mail*, therefore, welcomes a scheme which is likely to lead to development in trade in this product. From the evidence given before the select committee appointed to deal with the Geveeston Tramways and Timber Leases Bill, it appears that the proposal is to take up 26,000 acres of timber land lying beyond the town of Geveeston, in or near the valleys of the Kermadie and Arve rivers, and to utilise the timber growing thereon. With the aid of complete modern equipment, it is hoped to turn out 200,000 superficial feet of timber per week. The ports of the Commonwealth being open to the timber of this State, a demand for large quantities is expected from Victoria and Broken Hill, and it is further hoped that an increasing trade will be built up with the United Kingdom.

Uganda Railway.—CAPITAL AND REVENUE.—Sir George Taubman Goldie, in a letter to the *Times*, reviews this enterprise with respect to the manner in which the work has been done, and also in regard to its future. Answering the question whether there will be intrinsic value to show for the capital sum expended, he gives an unhesitating affirmative, his assertion being based on an inspection of the line throughout practically its entire length, and of the fully-equipped workshop, stores, and other accessories. It is probable that money might have been saved if time had been no object. Some of the temporary diversions, which have enabled material, labour, food, and water to be extended rapidly along the projected line would have been unnecessary. But the railway was not primarily a commercial speculation, and the public will not have forgotten the international situation up to 1899. The second question of interest is: how many years of loss or of mere covering of annual expenditure must be expected before the Treasury receives its first dividends. Sir G. T. Goldie feels no doubt as to the line ultimately proving a sound commercial speculation, but urges that the happy day may be hastened by a very moderate expenditure in assisting to develop the East African Protectorate. Its two needs are

IRRIGATION AND POPULATION.

For these we must look to paid Indian experience and assisted Indian immigration, excepting in that white man's country which the railway traverses between Kit, 267 miles, or, perhaps, Nairobi, 317 miles from Mombasa, and, roughly speaking, Fort Ternan, 542 miles. The breadth of this healthy zone in a bee line is, of course, considerably less—perhaps 160 miles in all; but it affords an ample field for settlers who are content not to make fortunes, but to provide prosperous livelihoods on the land for themselves and their descendants. It may be that Great Britain is no longer able to supply agricultural colonists of this stamp. The constantly accelerating migration from the country to the towns at home arouses reasonable doubt on this point. But if it is so, a useful lesson may be learnt from Argentina. Concessions of land in the white man's country may be granted on moderate terms to British resident capitalists, both great and small; and the manual labour can be supplied by Italian immigrants, who will remain, as in the regions of the Plate, for ten or twelve years, until they have amassed sufficient savings to enable them to live in comfort at home. Sir Charles Eliot, who has wisely devoted his first year of administration to constant travel throughout his extensive province, making himself acquainted with the wants and possibilities of the country, will certainly do all in his power to initiate and advance the development of his protectorate; but if Great Britain wishes for a harvest, she must undoubtedly lend the seed more liberally than heretofore, especially in view of the large province that the protectorate will take over from Uganda on March 31 next.

INDIA.

Demand for Machinery.—The *Indian Textile Journal* states that the demand for second-hand machinery is good. The bad financial straits in which many of the mills have to work preclude them from investing in new machines when they want one now and again. To some enterprising machinery merchant opening up a large showroom in Bombay the trade in second-hand machines would be found profitable. Such an establishment, conducted on well-organised lines, commanding an ample stock of machines, with prices within reasonable reach of the purchaser, ought to do well. There are some mills at the present moment badly in need of increasing their preparatory machinery, having room and power available for same, with a view to spin coarser counts on a larger scale than they could do at present.

Industrial Exhibitions in Calcutta.—Two industrial exhibitions have recently been held in Calcutta, the Mohan Mela having assembled for the eighteenth time, while the Indian Industrial Exhibition was held in the Beadon Garden in connection with the Indian Congress. The Mohan Mela exhibited works of purely Indian art, manufactured by Indian artisans. The noticeable exhibits were a Santipore hand loom preparing handkerchiefs of a fine texture, embossed with floral designs and names; a clock depicting scenes from the Mahabharata; a miniature locomotive engine and trucks plying on wooden rails; miniature steamships; clay models of Krishnagur representing faithful life-size figures; filigree work of Dacca in gold and silver, tastefully set with diamonds and pearls; a new device of a penny-in-the-slot machine turning out postcards. Besides this, ivory and sandal-wood work from the Punjab and Madras of exquisite skill; paintings on velvet from Jodhpore; and marble work of various designs from Jeypore were on view. Floricultural exhibits on a smaller scale were secured.

The Indian Industrial Exhibition was held for the first time. The exhibits were mainly articles sent by Indian firms, being both of European and Indian manufacture. Filigree work from Orissa, shellae and earthen models, automatic fountains and electric fans figured conspicuously among them. The fly-shuttle appliance for Indian handlooms, so much advocated by Mr. Havell, was on view, with a quantity of coarse fabric woven. The committee, consisting of native and European gentlemen, have succeeded in so far as to set many models for Indian enterprise. The exhibition of perfumery, medicine and drugs showed the extent to which the natives have developed the chemical industry, probably actuated by the visitation of epidemics.

FOREIGN COUNTRIES.

A New Dyestuff (Dye Sorrel).—The constantly increasing difficulty of obtaining the necessary tannic acid for the preparation of leather was mostly caused by the fact that the tanning stuffs formerly used have been extracted from the bark or fruit of trees. These grow slowly, and, in consequence, large tracts of land are necessary for obtaining the needed supplies. The endeavours to rectify these conditions, by using a quick-growing plant containing tannic acid, have been successful, through the discovery in the plains of Mexico and California of a sorrel (*Rumex hymenosepalus*) in the bulbs of which tannic acid exists. In a dried condition 35 per cent. of tannic acid is produced. As the wild plants were soon exhausted, plantations were commenced in 1896, and the large bulbs were used for tanning and the smaller ones for cultivating new plantations. The tannic acid is much increased by the plentiful use of water. The plants grow to the length of about a metre, and the leaves make an edible vegetable.—*Handels Museum*.

(It is interesting to note that the experimental cultivation of *Rumex hymenosepalus* was undertaken some years ago in New

South Wales, but no further development appears to have resulted.)

A New Textile Fabric.—The *Bolletino delle finanze* reports that some capitalists in Lombardy propose to make large plantations of zanzeviera in Erythraea, and also to build a spinning and weaving factory in Asmara. According to recent experiments, the new fabric is very useful for the manufacture of coarse goods, such as wagon cloths, and it is not unlikely that the zanzeviera fabric will compete seriously with the Manila hemp.

Brazil.—CONSULAR INVOICES.—The Austrian Consul in Curitiba reports that some firms in Curitiba were recently fined because the consular invoices gave no detailed description of the goods. It is to be particularly noticed that, in these Brazilian invoices, the weight of the goods, as well as the nature of them, must be very accurately specified. The fines are by no means small, and may even amount to three times the value of the goods.

Chinese Coal.—According to the *Straits Budget*, a coalfield of vast magnitude, giving fuel of a very high quality, will shortly be in full operation within a few hours' steam from Shanghai. It lies in the province of Anhui, quite close to the capital, Ngankin, which is situated on the Yangtse, less than a day's steaming from Shanghai. It is in the centre of an important carboniferous region, and foreigners have long known and often tried to get permission to tap the coal seams, which borings have shown to be extraordinarily rich and easily worked. The mines are to be worked by Japanese and Chinese capitalists.

Compressed Wood Casks.—The German Consul in Naples reports that a company has been formed in Bari for the manufacture of wooden casks by hydraulic pressure. The casks possess a cylindrical shape and are cheaper and more durable than the ordinary casks. On the other hand it is said that repairs will not be possible. The factory employs at present 80 workmen and produces 150 large casks daily. Up to the present, however, they are not much used in trade.—*Handels Museum*.

Japan.—EXPORT OF MATCHES.—During the last three years a decrease in the export of matches from Japan has taken place. For instance, the export from Kobé to China, Hong Kong and British India has fallen from six million yen in 1898 to 5.4 millions in 1900. The German Consul reports that this is caused by the bad quality of the Japanese matches, which is the cause of universal complaint. A fire on board of one of the Austrian mail steamers was attributed to a parcel of Japanese matches, which spontaneously ignited, and were without doubt the cause.

Japan.—SHIP-BUILDING.—The extraordinary progress in Japan of ship-building, which is strongly supported by the Government, has been shown by a report of the Yokohama Chamber of Commerce of November last. The United States Government has given an order to the Uraga Dock Company in Yokohama to build six gunboats for service in the Philippines. A representative of the above-named company went to Washington on the 24th October last, to settle details and terms of contract. The cost of one of these torpedo-boats is estimated at 0.15 to 0.20 million yens.

Trade between Russia and Japan.—The Odessa correspondent of the *Times* learns that an official of the Japanese Commercial Bureau has arrived in Russia with a commission from the Japanese Minister of Commerce, and will shortly visit Odessa for the purpose of supplementing the information already gathered by previous Japanese delegations in regard to the conditions and requirements of Russian markets and the possibility of establishing new markets in Russia for Japanese products. He will be accompanied on his visit to Odessa by a representative of the Russian Bureau of Commerce. One of the principal questions in view is that of establishing a direct service of steamers between Japanese and Black Sea ports. The negotiations are, it is stated, practically assured of success, in view of a promise given by the Japanese Minister of Commerce to accord material assistance to the new service, if established. The Russian authorities, on their side, are favourable, as the project should stimulate the export of many of Russia's products, such as sugar and kerosene. For the purpose of familiarizing Russian traders with the quality and variety of Japanese exports, commercial information bureaux are to be established in Moscow, Odessa, Warsaw, and other leading centres of trade in Russia, with the assistance of Russian commercial agents, to whom will be delegated the task of acquainting Russian producers and exporters with Japanese requirements.

United States.—MINISTRY OF COMMERCE.—For some time past the opinion has been gaining ground regarding the necessity for establishing a Ministry of Commerce for the United States, as is the case in most European countries. A Bill has passed the Senate creating a Department of Commerce and Labour, which is to unite the Consular department, or that portion of it which has to do with trade and commerce, the Government Statistical Bureau, and the Labour Bureau, into the Ministry of Commerce.

LABOUR MARKET.

UNITED KINGDOM.

British Merchant Service.—A Board of Trade Committee has been appointed to enquire into and report upon (1) The causes that have led to the employment of a large and increasing proportion of Lascars and foreigners in the British merchant service, and the effect of such employment upon the reserve of seamen of British nationality available for naval purposes in time of peace or war; (2) The sufficiency or otherwise of the existing law and practice for securing proper food, accommodation, medical attention, and reasonable conditions of comfort and well-being for seamen on British merchant ships; (3) The prevalence of desertion and other offences against discipline in the mercantile marine, and to make such recommendations with respect to these matters as they may think fit.

COLONIES.

The usual monthly report, compiled by the EMIGRANTS' INFORMATION OFFICE, states that there is no demand for more labour in Canada during the winter season, but several indoor trades—notably that of the tailors—have been very busy. Although the strike of miners at Rossland, British Columbia, has not formally been declared off, work has been for the most part resumed, and the supply of labour is quite sufficient.

Australia (New South Wales).—There have been disputes and strikes in the glass bottle trade, among tailoresses in the clothing trade, and at the Hillgrove mines; but they are now for the most part settled, a rise in wages having been conceded. Many persons at the Broken Hill silver mines complain of want of work: a reduction in the wages is contemplated, owing to the low price of lead. Reports state that at Mudgee there is a demand for farm and general labourers, female servants, carpenters, joiners, wheelwrights and engine drivers; that at Walgett "a few good steady men, able to turn their

hands to anything, could earn £3 a week," but that at Willcannia there is no demand for any kind of labour. (Victoria).—The Boards appointed under the Factories Act have determined that the lowest wages which may be paid to a copper-plate engraver shall be 80s. a week, of 48 hours, to male tailors' cutters and machinists in the clothing trade 7s. 6d. a day and to females 3s. 4d., to a harness maker or saddler 48s. per week for males (48 hours), and 20s. for females (45 hours). There is no demand at Melbourne for more mechanics. The carpenters at Melbourne have struck for a rise in their wages from 9s. to 10s. a day; the latter rate is already being paid to the more expert hands. Round Bendigo and in other country districts there is an opening for competent farmers and farm labourers. (Queensland).—The Report of the Government Labour Bureau for the quarter ending 30th September last, showed that there was a demand for a few mechanics at Charters Towers, Townsville, etc., but none elsewhere; that there was a good demand for agricultural labourers, and general labourers, especially in the South; that plantation hands were wanted in the districts of Bundaberg, Maryborough, etc.; that neither station hands nor miners were wanted anywhere; and that female servants were wanted in the North. (Western Australia).—Many of the carpenters at Fremantle, who are being paid less than the 12s. a day which others receive, have struck work. There is a good demand for farm labourers and female servants. There is no demand for miners, and very little for mechanics, unless they bring a little money, or are specially skilled.

New Zealand.—The building trades have been busy almost everywhere (but not at Wellington or Dunedin), and at Invercargill bricklayers have been in demand. The engineering trade is not giving full employment to men at Dunedin and Wellington; but elsewhere it is fairly good, and in Auckland blacksmithing and boiler-making have been brisk. The boot trade has been very good at Blenheim, and one or two other places, but very slack at Wellington and dull elsewhere. Both men and women in the clothing trades have been busy everywhere, and in Auckland, Dunedin and Invercargill there has been a scarcity of hands. Coal-miners have been busy at Westport. Unskilled labour has been for the most part well employed, but there is no demand for more, except in parts for dairyhands and milkers.

South Africa.—No one is now allowed to land in South Africa without a permit. This must be applied for at the Permit Office, 39, Victoria-street, London, S.W. The applicant must possess £100, or prove that he is in a position to maintain himself in South Africa. Applicants living within fifty miles of London must apply in person. These permits are no guarantee that the holders will be allowed to proceed inland. Only refugees, Government employees, and persons engaged in a service of a public nature will be permitted to proceed to the Transvaal. Candidates for the new South African Constabulary in the Transvaal and Orange River Colony should apply to The Recruiting Officer, S.A.C. Recruiting Office, King's-court, Broadway, Westminster, S.W.; they must be good riders, good shots, single, strictly sober, and from 20 to 35 years of age; they will be given free passages to South Africa. Farriers also are wanted for this force.

EMIGRATION AND IMMIGRATION.

* * *The Imperial Institute acts in concert with the Emigrants' Information Office (which is under the direction of the Colonial Office), of 31, Broadway, Westminster, S.W.; and also with the British Women's Emigration Association, now temporarily carrying on its work in rooms at the Institute. The Handbooks and Quarterly Circulars issued by the Emigrants' Information Office may be obtained at the Commercial Intelligence Office. Special information and practical advice respecting Canada and Cape Colony will also be furnished by the Curators of these Sections.*

UNITED KINGDOM.

General Emigration.—The number of passengers that left the United Kingdom for places out of Europe during 1901 was 302,848, being an increase of 4,287 over the previous year. Nearly two-thirds of the total—namely, 194,888—went to the United States, and 28,636 passengers went to South Africa, as against 25,518 in 1900. There was a set-back in the movement to Canada, the number of emigrants in 1901 being only 43,013, or nearly 7,000 less than in 1900. Of the total—302,848—only 172,140 were of British origin.

The hon. sec. of the British Women's Emigration Association reports 312 applications during the month ended January 21, from women of all classes, for information about their chances of employment in the colonies. In many cases some previous special training is recommended, that there may be sufficient proof of the suitability of these volunteers for useful service in some outlying portion of the Empire.

The County of Gloucester has inaugurated a special course of instruction for intending colonists, in its scheme of Technical Education. It includes Dairy work, Laundry, Cooking, etc., and all through the United Kingdom there are now opportunities within reach of almost every one, for acquiring some scientific knowledge of practical domestic and agricultural work. The number of travellers sent off through the Association in the past month is 26; eight went to Australia and New Zealand. A party of teachers for South Africa sent out by the Government for the Refugee Camps sailed on January 18th. Many applications continue to be received from employers in South Africa, or returning there, for servants, and these are carefully selected, generally by the employers themselves or their friends, from those whose applications and references have been investigated and approved by the Association. This seems to show that the article on "Female Emigration to South Africa" in a well-known monthly magazine does not accurately express the opinion and experience of ladies resident in the Cape Colony. The writer, after censuring both mistresses and servants, urges as a remedy that the former should close their doors to all imported assistance "until such times as they shall have made the people of the country realise the almost sacred nature of the bond between faithful attendants and grateful heads of households."—"That the importation of any form of individual talent testifies to the absence, in the new land immigrated to, of the peculiar qualifications in demand." "We should devote ourselves to training for domestic service some of our colonial girls—that we should use every argument in our power to remove the mistaken idea, which is taking such root in the colonies, that domestic service is degrading."

Earlier we read—of course it will take time, perhaps years; are the mistresses to be willing to wait to have their beds made and their dinners cooked until the Cape girls attain to the highest ideal of the dignity of domestic service?

Speaking further of lady colonists, it is admitted that assistance must be imported, and that they must not venture to marry until "from some corner of our world has been collected efficient paid assistance."

It is consoling to read the admission "that the higher class of servants are as reliable and as faithful abroad as at home."

COLONIES.

Farm Pupils in Canada.—In consequence of the agricultural prosperity in Canada, a number of agencies have sprung into existence in the United Kingdom which offer to secure situations on Canadian farms for young settlers, for which a premium is demanded. The High Commissioner announces that any young man possessing a sound constitution, and who is prepared to accept the conditions of farm life, can secure the opening he desires by giving his services in return for board and lodging as one of the farmer's family, together with a nominal wage for the first year. The circumstances are not such as to necessitate any payment as a premium. Assistance will be given to enquirers at the High Commissioner's office, Victoria-street, S.W.

In this connection a letter, written from Ottawa to the *Times*, is of interest. It clears away misconceptions which exist in England as to the necessity for "roughing it," under which would-be farmers in Canada are supposed to lie. Englishmen who know something of agricultural pursuits and have a little capital, can secure established farms in the eastern provinces at reasonable prices with little difficulty; and on such properties they will find farm buildings already standing, and be generally close to church, school, and railway. "In the strictly agricultural districts," the writer says, "the size of these farms is usually 100 or 150 acres each (two can sometimes be acquired together); in the fruit-raising parts of the Niagara peninsula the acreage is generally less and the price greater. The price of the class first mentioned is about £1,000 to £1,500, according to size, etc., and the bulk of the purchase money is nearly always payable by instalments, if the purchaser so desires. There is no 'roughing it' in a new country' about this. Nor is there any difficulty in finding such properties. An estate agent's books will supply a list to select from, and the inspection of those selected is no more difficult in an Ontario county than in an English shire."

CUSTOMS TARIFFS.

UNITED KINGDOM.

DRAWBACK REGULATIONS FOR SYRUP OR MOLASSES OF BRITISH MANUFACTURE.—The Board of Trade are in receipt of a notice which has recently been issued by order of the Commissioners of Customs with regard to the drawback allowed on the importation of syrups or molasses of British manufacture. The following is the text of the notice:—

"Subject to the conditions specified in the second Schedule to the Finance Act, 1901, the Board of Customs allow, on the exportation of syrups or molasses of British manufacture, drawback at the rates of import duty for molasses (1s., 2s., or 2s. 9d. per cwt.), according to the amount of sweetening matter contained in the article.

"Any claim for drawback, as to which the exporter may be able to prove that the amount allowable under the preceding paragraph is not equal to the duty paid in respect of the quantity of that article, which appears to the satisfaction of the Treasury to have been used in the manufacture or preparation of the goods, will be dealt with upon its merits; but a statutory declaration will be required in each case showing the quantity and description of the sugar or other article used in the manufacture, and the relative rate of duty paid upon importation.

"The Board of Customs, however, will, on application, be prepared to consider whether, and on what conditions, a statutory declaration in each instance may be dispensed with in the case of regular exporters of British manufactured syrups or molasses."

REGULATIONS WITH REGARD TO COAL SHIPPED UNDER PRE-BUDGET CONTRACTS.—The following notice has recently been issued by order of the Commissioners of Customs with regard to coal shipped under pre-Budget contracts:—

"With reference to Section 3 (2) of the Finance Act, 1901, which limits the concession in regard to pre-Budget coal contracts to coal exported before the 1st January, 1902, exporters of coal are hereby informed that duty must be paid on all coal liable to duty which has been shipped after midnight on the 31st December last.

"Shipments under accepted contracts, for which authorities for free shipments may have been given, are not exempt from this direction, notwithstanding that the coal covered by the authority may not have been all shipped by midnight on the 31st December.

"In order to insure that duty is paid on any balance that may be shipped after that hour on any such authority, shippers will have to enter into bond or make a deposit in cash, sufficient to cover payment of duty on such balance."

COLONIES.

British Honduras.—NEW EXPORT DUTIES.—The Board of Trade have received from the Governor of British Honduras a copy of an Ordinance (No. 20 of 1901), which repeals Ordinance 13 of 1899, and provides for the imposition of new duties on logwood and mahogany on export from the colony.

The export duties leviable have been fixed by an Order-in-Council, dated 5th December, 1901, and made under Section 1 of Ordinance 20 of 1901, as follows:—

Export Duty.	
Logwood	25 cents per ton.
Mahogany	75 " 1,000 sup. ft.

The duties previously in force were, on logwood, 50 cents per ton; and on mahogany, 1 dollar 50 cents per 1,000 sup. ft.

Ceylon.—EXPORTATION OF ARMS, ETC., MAY BE PROHIBITED.—Ordinance No. 12 of 1900, repealing Ordinance No. 7 of 1900, empowers the Governor to prohibit, by Proclamation published in the *Government Gazette*, the exportation from Ceylon of arms, ammunition, military and naval stores, and such articles as may be made useful for the purpose of increasing the quantity of arms, ammunition, etc.

Jamaica.—EXCISE DUTY ON MATCHES.—The "Match Excise Duty Law, 1901" (No. 12 of 1901), which was passed on 30th March, 1901, provides for the imposition of an Excise duty on matches manufactured in Jamaica, as follows:—

Excise Duty.	
Matches, per gross of boxes containing 50 sticks	
Or less per box	3d.

[And in proportion for boxes containing a greater number of sticks.]

Provision is also made for the payment by persons engaged in the business of manufacturing matches in the Island, of a licence duty of £1 per annum in respect of each manufactory.

Southern Rhodesia.—EXPORTATION OF WAR MATERIALS MAY BE PROHIBITED.—An Ordinance (No. 3 of 1901), promulgated on 22nd November last, empowers the Administrator to prohibit (by notice in the *Gazette*) the export or removal from Southern Rhodesia of any of the under-mentioned articles or things, being materials of war, except under permission

granted in writing given by himself or by some officer or person authorised by him to grant such permission:—

1. Guns and arms, comprising every weapon which can be used or employed in war of whatever kind, and the machinery for manufacturing the same.

2. Ammunition and explosives of all kinds, as also the ingredients used in their manufacture, and the machinery for manufacturing the same.

3. Military stores, comprising clothing, equipments, accoutrements, harness, saddlery, implements, and tools, wire, chemicals used in the manufacture of explosives, signalling and searchlight equipment, telegraphic and electric light plant suitable for field use, limelight apparatus, heliographs, optical instruments used in military operations.

4. Naval stores of all kinds, including, *inter alia*, materials used in ship construction, such as rivet iron, angle iron, round bars, rivets, sheet plate iron, forgings, and armour plates; marine engines and the component parts thereof, including screw propellers, paddle-wheels, cylinders, cranks, shafts, boilers, tubes for boilers, boiler-plates, fire-bars; every article, which is, or can become, applicable for the manufacture of marine machinery; anchors, chain cables, wire hawsers, capstans, windlasses, steam winches, masts, derricks, davits; torpedoes and their component parts, and machinery for manufacturing them; all apparatus for projecting inflammable materials or firing torpedoes; steam and other boats suitable for use for warlike purposes; submarine cables, submarine mines and apparatus appertaining to them; Marconi apparatus; electrical fittings used on board ship.

Transvaal.—CUSTOMS LAW.—A proclamation relating to the importation of goods into this colony provides that the duties on goods consigned to other places than Pretoria and Johannesburg shall be payable at the colonial ports of entry, and that duties on goods consigned to these towns shall be payable on delivery. The Customs law of the late South African Republic remains in force.

INDIA.

Merchandise Marks Act.—DECISION RESPECTING CIGARS.—Customs Circular (No. 17 of 1901), dated 29th November, 1901, refers to the indication of the country of origin of cigars on importation into India, as required by the Merchandise Marks Act, 4 of 1889. The Government of India have given their decision and are of opinion that "the use of words of a particular language on the paper bands round cigars shall not be regarded as a 'false trade description,' so long as the country of manufacture is clearly indicated on the box containing the cigars, and so long as the bands themselves are not stamped with a counterfeit trade mark."

FOREIGN COUNTRIES.

Belgium.—IMPORT DUTIES ON ACETIC AND SULPHURIC ETHER.—The Board of Trade have received a copy of a Belgian Royal Decree, fixing the import duties on sulphuric ether at 5 francs per 100 kilograms, and on acetic ether at 8 francs per 100 kilograms.

Germany-Samoa.—INTRODUCTION OF GERMAN MONETARY SYSTEM INTO SAMOA.—The Board of Trade have received copies and translations of two Ordinances of the Imperial Governor of Samoa affecting the monetary system and tariff of that country.

The first of these Ordinances decreed that on and after the 1st July last the German Imperial standard of coinage should take effect in the Protectorate of Samoa. British sovereigns and half-sovereigns, however, are to be legal tender, and the rate of exchange is to be for the present £1=20.42 marks. British silver coins will also be accepted by the public Treasury to the amount of 20 shillings, and for a period of at least two years at the rate (liable to alteration) of 1 shilling=1 mark.

The second of these Ordinances, which also came into force on 1st July last, gives the scale of import duties leviable in the new currency. The Tariff is now as follows:—

Tariff No.	Tariff Classification.	Rates of Duty.	English Equivalents.
		Mks. Pfg.	s. d.
1	Ale, porter, and beer	Litre 0 20	Gall. 0 11
2	Spirits	" 2 50	" 11 4
3	Wines, except sparkling wines	" 0 50	" 2 3
4	Sparkling wines	" 1 40	" 6 4
5	Tobacco	Kilog. 4 50	Lb. 2 0
6	Cigars	" 9 00	" 4 0
7	Sporting arms	Each 16 00	Each 16 0
8	Gunpowder	Kilog. 2 50	Lb. 1 1½
9	All other articles	10 % ad val.	10 % ad val.

The Ordinances, which are too long to quote in full, may be seen in the original and in translation at the Commercial Intelligence Branch of the Board of Trade, 50, Parliament-street, S.W., any day between the hours of 10 a.m. and 5 p.m.

Russia.—CUSTOM DECISIONS.—The Russian Department of Customs have recently issued circulars relative to the classification of the following articles under the Imperial Customs Tariff:—

Solid fat worked, crude, or melted, and degreas, are to be dutiable under Section 51, Point 2 (instead of Point 3) of the Tariff, at the rate of 1 rouble 12½ copecks per pound gross (7s. 4½d. per cwt. gross), with the 20 per cent. surtax laid down by the Imperial ukase of the 5th August, 1900. [See *Board of Trade Journal* for the 9th August, 1900.]

Rollers and oval plates for phonographs, gramophones, and graphophones, are to be dutiable under Section 172, Point 4, of the Tariff, at the rate of 15 copecks per funt (£1. 19s. 4d. per cwt.).

San Salvador.—CUSTOMS MODIFICATIONS.—Several Laws and Ministerial Ordinances affecting the tariff of San Salvador, appeared during last year in the *Salvadorian Diario Oficial*. The following modifications of the Customs Tariff have accordingly to be noted:—

Bags containing coffee intended for export are exempt from all duties.

Coloured cotton yarn is subject to an import duty of 5 centavos per kilog.

Unbleached cotton tissue ("mantadril"), with a single coloured stripe not exceeding 1 centimetre in width, is dutiable as "cotton drill, uncoloured," at the rate of 20 centavos per kilog.

Sheet cotton wadding for padding the interior of clothing is dutiable at the rate of 2 centavos per kilog.

Bags. Empty bags, intended to contain indigo for export, are dutiable at the rate of 50 centavos per kilog. The amount of import duty paid on bags in which ores are exported, will be refunded in cash to exporters of ore, at the time of exportation.

Indigo is now exempt from all duties on exportation.

Sweden.—CUSTOMS ALTERATIONS.—The following alterations have been made in the Customs Tariff of Sweden by Royal Decree, taking effect from the 1st ult. :—

Tariff No.	Articles.	Rates of Duty.	English Equivalents.
64 ¹ A	Embroidered articles, not specified, finished or begun— Embroidered ribbons of cotton tulle, even when provided with other needle-work; also similar embroidered tissues, manifestly intended to be cut up into ribbons	Kron. öre.	s. d.
64 ² B	Embroidered ribbons of other cotton or of linen tissue, even when provided with other needle-work; also similar embroidered tissues, manifestly intended to be cut up into ribbons	Kilog. 6 50	Lb. 3 3 ¹
	Other kinds	" 5 50	" 2 9 ¹
	As the material upon which embroidered, with an addition of 100 per cent.		
	<i>Note.</i> —No deduction made for boxes, paper envelopes, cards, or packing paper.		
	<i>Colours and colouring substances.</i>		
141	White lead, of all kinds	Free.	Free.
284 ²	Chemico-technical preparations, not specified— Chloride of gold, chloride of gold and potassium, chloride of gold and sodium (gold-salt), chloroplatinite of potassium, and chloride of platinum	Kilog. 0 08	Lb. 0 0 ¹
591	Playing cards, and painted or printed cardboard in the sheet, whether with or without figures, intended to be cut up	" 1 50	" 0 9
	<i>Note.</i> —A special regulation lays down the formalities to be observed before the cards are delivered to the owner.		

TRANSPORT AND FREIGHTS.

The Freight Market.—Outward rates are weak, but in most directions not quotably lower. Last fixtures have been on basis of Genoa, 5s. 6d.; Malta, 4s.; Venice, 6s.; Alexandria, 5s.; Las Palmas, 6s.; Buenos Ayres, 9s. 6d.; Colombo, 10s. American markets are in a state of stagnation. **Australia** continues weak. Current quotations are 27s. 6d. Europe, 25s. Africa, Newcastle-Manila 12s. 6d., Java 10s., Singapore 8s. **Black Sea** easy, Odessa berth paying 9s. **Eastern** markets steady at slightly improved rates. Bombay paid 15s. 6d., Kurrachee 16s., Calcutta 22s. 6d., Rangoon 21s. 3d. **Mediterranean** markets are extremely dull, and no business has been effected except in ore. **River Plate** steady at 17s. 6d. San Lorenzo limit.—WEDDELL, TURNER & CO., London, January 22, 1902.

UNITED KINGDOM.

Manchester Ship Canal.—The Manchester racecourse at New Barnes has now been purchased by the Ship Canal Company for the sum of £265,000. The acquisition of the estate will enable the Ship Canal Company to carry out extensions to their docks which have been long needed, and already the work of constructing a through railway round the course has been commenced. It has been estimated that the proposed new works will nominally increase the capacity of the docks for ocean traffic by something like 70 per cent. No fewer than 142 acres of land will be added to the dock estate. It is proposed to ultimately construct two large new basins, each about half-a-mile in length. A portion of the dock near to Mode Wheel locks will be first made, and it is not likely that the Company will seek powers for the construction of the second dock until the first is completed. When both the docks have been made, two miles will have been added to the existing quay frontage, and berths will have been provided for 32 vessels of an average length of 330 feet. There are at present about 5¹/₂ miles of quays at the docks, but not more than three miles are actually available for the accommodation of deeply laden ships, for the docks above Trafford Bridge cannot be used by large steamers. The remainder of the racecourse estate will be utilized for the erection of transit sheds and warehouses and the provision of railway sidings. These last are needed for the proper sorting and marshalling of railway wagons containing cargo, as well as for the exchange of traffic between the Canal Company and the various railway companies whose systems are connected with the dock railways. The cost of the railway and the dock is estimated at £150,502, while £92,000 has been set apart for sidings, storage grounds, roads and subsidiary works. To these figures must be added, of course, the sum of £265,000, which has been paid for the land. The new transit sheds, it is understood, will be built by private enterprise and leased to the Company. According to the evidence given by Mr. W. H. Hunter, Chief Engineer of the Ship Canal Company, in the arbitration between the Ship Canal Company and the Racecourse Company, the amount which has been expended in the past on the construction of the Salford Docks, lying between Mode Wheel locks and the Trafford-road swing bridge, is £933,236, while a further sum of £317,467 has been expended upon the Pomona Docks, between the Trafford-road swing bridge and the Wooden-street swing bridge. In addition, not less than £907,758 has been spent in the equipment of the docks, £685,848 of this amount having been expended since the opening of the canal in 1894. The cost of the equipment of the Salford Docks was £797,930 and of the Pomona Docks £109,828. Thus the Salford Docks have already cost in construction and equipment a sum of £1,413,699

and the Pomona Docks a sum of £427,295, a total of £1,840,944, apart from the cost of the land.—*Manchester Guardian*.

COLONIES.

Transport in West Africa.—The *Gold Coast Globe* says it is now very generally recognised that the paramount difficulty which faces the mining industry on the West Coast of Africa is the lack of transport. In the past six months much has been done to combat this drawback by the construction of the railway from Sekondi to Tarkwa, and by making roads from the various coast ports to the interior and the mines. Despite this, however, the mining companies still continue to suffer greatly. Numerous mining companies whose reefs are not in the immediate neighbourhood of Tarkwa have taken a very determined attitude with regard to the vital matter of transport from the coast to the mining properties, and an elaborate scheme for utilizing the Ankobra waterway for the purpose of transport has been prepared. Although all the details have not yet been completed, the new transport system is certain to have a very marked effect on mining developments. A company has been formed which will immediately set to work and erect the necessary storehouses, and will make a complete survey of the river Ankobra and all the necessary arrangements for the commencement of active operations.

INDIA.

New Railways.—It is announced that the Secretary of State for India has sanctioned capital expenditure on railways during the ensuing financial year of 1,050 lakhs of rupees (£7,000,000). This sum is to be almost equally divided between the provision of rolling stock and other works in connection with existing lines on the one hand, and the prosecution of a construction programme on the other. Of the latter moiety, 350 lakhs will be absorbed by lines now in progress, and 174 lakhs by new railways. Of these an important one is the line which will cross the Ganges near Allahabad and connect that city with Faizabad, the centre of the fertile districts watered by the Goghra. The line, which will reduce the distance by rail between the two cities from 235 miles to 98, will cost 117 lakhs, 40 of which are allotted for the next financial year. Some of the other lines to be begun in 1902-1903 are of equal importance. The East Indian grand chord is to be completed by filling in the gap of 112 miles from Gya to Katrasgarh, which is to cost, in round figures, two crores of rupees (£1,333,000), one-fourth of which sum is now sanctioned. Twenty lakhs of the estimated cost of 50 lakhs are granted for the Jech-Doab loop, which is intended to serve the large area brought under cultivation by the irrigation canal of the same name, and will connect with the North-Western system at Lyallpur. The Bengal-Nagpur railway is to be given long-desired access to the Palamow and Daltongunj coalfields by a line bridging the Damuda river, the preliminary amount allotted being 20 lakhs. The ten lakhs set aside for the Ranaghat-Murshidabad line bears but a small proportion to the total cost of an extension which, with projected feeders, will do much for the development of Eastern Bengal. All the lines mentioned are in Bengal and Upper India, and their admission into the official programme has left little margin for expenditure in other parts of the country. But any jealousies which might otherwise be aroused in the case, at least, of Western India will be obviated, we presume, by the sanction accorded to a scheme which has for some years been pressed on the notice of the Indian Government by the Bombay Chamber of Commerce—the Godhra-Baroda chord. Forty-five miles in length, it will save nearly 30 miles in the through distance between places north and east of Godhra and south of Baroda, and obviate the delays to which the traffic of the Anand-Godhra section of the Bombay, Baroda, and Central India railway is subjected in the monsoon. There will, however, be some disappointment on the part of commercial interests in Bombay that Government is not able to include in the programme the much more important Nagda-Bara-Muttra extension, to which it is pledged, and which, by shortening very materially the connection between Bombay and "the granaries of India" in the north would be of great value in the event of famine in Southern India. Lower Burma is represented in the programme by the Henzada-Kyauing metre-gauge line, 65 miles in length, which will open up a rich rice-growing district; and Southern India by the Azikhel-Mangalore line, for which ten lakhs of rupees are allotted.

FOREIGN COUNTRIES.

China.—The Russian Amoor Company for Navigation and Trade is having a number of flat-bottomed steamers built to work in connection with the Eastern Chinese railway. Two passenger boats of the kind, and three steam tugs, are to go from Hamburg in the spring for use on the upper reaches of the rivers Amoor and Shilka.

Germany (Hamburg).—The report of the Hamburg Chamber of Commerce shows that there was a large increase in the shipping of that port during the past year. The steamer fleet of the port now numbers 521 vessels of 842,966 net register tons, against 486 steamers of 748,435 tons a year ago; and the sailing fleet 333 vessels of 242,765 tons, against 307 vessels of 240,419 tons. It is admitted that ocean freights are now 30 to 40 per cent. lower than a year ago, which is considered a serious matter in view of the high prices of coal and the higher level of wages.

Portuguese West Africa.—The *Engineering News* (New York) reports that the Compagnie de Mossamèdes (Paris) has received a concession of land in Angola from the Portuguese Government for a railway from Port Alexander to the interior. Amongst the projects of the Company are the establishment of a port, construction of quays, docks, telegraphic lines, etc. The concessionaires have recently made numerous mining concessions to subsidiary companies.

United States.—PANAMA CANAL.—The report of the Isthmian Canal Commission was published on the 20th January last, and, as was expected, was in favour of the acceptance of the offer of the Panama Company to sell its property to the United States for \$40,000,000. The report of the Commission is unanimous, and is to the effect that, after considering the changed conditions now existing and all the facts and circumstances upon which its judgment must be based, the Commission is of opinion that the most practical and feasible route for the canal is the Panama route.

United States.—NEW LINE OF STEAMERS FROM NEW YORK TO THE LEVANT.—It is reported that the Hamburg-American Steamship Line have made arrangements for a line of steamers between New York and the Levant. The plans are completed, and in February a fleet of four ships will be started running. The trips will be made monthly, and while the vessels will be principally devoted to freight, there will also be accommodation for a few passengers. Among the ports which will be touched are Malta, Alexandria, Smyrna, Athens, Constantinople, Odessa, and intermediate places. The round trip will occupy about two months. As business increases the fleet will be enlarged and more frequent trips will be made. It is also stated that the same company is building two new steamers for service between New York and Hamburg—the *Moltke* and the *Blucher*, each of which will be between 12,000 and 13,000 tons. They will have no first-class accommodation,

and will be used mainly as cargo boats. The first of these vessels will make her maiden trip next March.—STEAMSHIP SERVICE WITH THE WEST INDIES AND SOUTH AMERICA.—The United States Steamship Company, which is organising a direct steamship service between Boston, the West Indies, the Mexican Gulf ports, and South America, will place 14 boats in the line. The carrying capacity of four of these steamers will be 10,000 tons each, of six of them 5,500 tons, and of the other four 2,500 tons. The four largest ones will run to Mexico and South America, the six medium-sized ones to Cuba and Porto Rico, and the four smallest to different ports of the Islands. The operations are expected to commence at the end of this month.

OFFICIAL AND COMMERCIAL CONTRACTS.

UNITED KINGDOM.

London.—The London County Council invites TENDERS, until the 4th March, for the SUPPLY and DELIVERY into carsheds in South London of DOUBLE-DECKED, DOUBLE-BOGIE, ELECTRIC-FRAMECARS. Particulars (£3) may be obtained at the County Hall, Spring-gardens, S.W.

North Eastern Railway.—The Directors invite TENDERS, until the 12th inst., for the WIDENING of a PORTION of the MAIN LINE between Newcastle and Leamside, from Penshaw Junction to Wapping Bridge, being a distance of about 1¹/₂ miles. Particulars may be obtained from Mr. Charles A. Harrison, Central Station, Newcastle-on-Tyne.—The Directors also invite TENDERS, until the 12th inst., for the CONSTRUCTION of a NEW RAILWAY BRIDGE and APPROACHES thereto over the river Tyne at Newcastle. The bridge is for four lines of rails, and is 110 feet above high water. Particulars may be obtained as above.

Stamford.—The Corporation invite TENDERS, until the 17th inst., for the following new SEWERS, together with MANHOLES, LAMPHOLES, FLUSHING TANKS, VENTILATORS and other WORKS connected therewith. About 20,560 yards of STONEWARE PIPE SEWERS (from 6 in. to 21 in.). Also for about 2,280 yards of CAST IRON PIPE SEWERS (6 in. to 21 in.), with CONCRETE MANHOLES. A short length of 30 in. CONCRETE SEWER; SEPTIC TANKS; EJECTOR CHAMBERS, CONCRETE CARRIERS, DISTRIBUTION CHAMBERS, and other works. Particulars (£5) may be obtained from J. B. Everard, 6, Millstone-lane, Leicester.—The same Corporation also invite TENDERS until the 17th inst., for the ERECTION and COMPLETION of an ENGINE HOUSE, COTTAGE, and OUT-BUILDINGS thereto, to be erected in Albert-road, Stamford. Particulars (£2. 2s.) may be obtained as above.

Woolwich.—The Secretary of State for War is prepared to entertain PROPOSALS for FILLING-UP the INNER BASIN of the Royal Dockyard, Woolwich. Particulars may be had on application to the Superintendent, Building Works Department, Royal Arsenal, Woolwich.

COLONIES.

New Zealand.—TENDERS are invited by the New Zealand Government for a DIRECT STEAM SERVICE between NEW ZEALAND and SOUTH AFRICA, and for an Alternative Service between New Zealand, Western Australia, and South Africa. The service to be monthly from four loading ports in New Zealand in geographical order, and three ports for discharge in South Africa, namely:—Durban, Port Elizabeth, and Table Bay. The maximum subsidy available for such service is £30,000 per annum, the present contract to be for three years. The steamboats must be fitted up with refrigerators for frozen meat and other refrigerated produce. The steamboats must be not less than 2,000 nor more than 4,000 tons capacity draught, and when loaded must enable them to discharge alongside the wharves of the above-mentioned ports. Accommodation must be provided for passengers, mails, and live stock. Preference will be given to tenderers offering highest speed and best passenger accommodation, speed to be not less than ten knots per hour. The rates of freight from New Zealand to South Africa to be as follows:—Wheat and flour, 30s. per ton weight; barley, 32s. 6d. per ton weight; oats, 35s. per ton weight; bran, 40s. per ton weight; potatoes (in sacks), 40s. per ton weight; hay (oaten or meadow), pressed in bales, 37s. 6d. per ton of 50 cubic feet measurement. Frozen meat and dairy produce at current summer rates ruling between New Zealand and London. Potatoes in boxes, 37s. 6d. per ton of 50 cubic feet measurement. Other goods at proportionate rates not less than those current between New Zealand and London from time to time to be fixed by the New Zealand Government. Contractors tendering for alternative service to state prices of cargo for Western Australia discharging at Fremantle, the maximum cargo for Western Australia to be not more than one-quarter, and minimum if offering not less than three-sixteenths (3/16) of steamers' carrying capacity. Marked written or telegraphic tenders, to be addressed to the Secretary, Industries and Commerce, Wellington, New Zealand, or to the Agent-General for New Zealand, 13, Victoria-street, London, S.W., will be received up to the 14th inst.

Victoria.—The Committee of the Fund for the erection of a Memorial to Her late Majesty Queen Victoria in Melbourne, Victoria, Australia, invite DESIGNS from sculptors for a statue of Her late Majesty in marble or bronze. Designs to be sent in to the Agent-General for Victoria in London not later than 1st May, 1902, or to the Town-clerk of Melbourne (hon. secretary to the Committee), at the Town-hall, Melbourne, not later than 2nd June, 1902. Information can be obtained at the office of the Agent-General for the State of Victoria, 15, Victoria-street, Westminster.—TENDERS are invited by the Government of Victoria, until the 14th April, for 15,850 tons of STEEL RAILS and 1,505 tons of FISHPLATES. Particulars may be obtained from the Agent-General for Victoria, 15, Victoria-street, S.W., on and after the 10th inst.

INDIA.

Bengal-Nagpur Railway.—TENDERS are invited, until the 11th inst., for BRIDGEWORK (150 ft. spans). Particulars may be obtained at the Company's office, 132, Gresham-house, Old Broad-street, E.C.—The same Company also invites TENDERS, until the 18th inst., for 175 BOGIE COVERED GOODS WAGONS, of steel throughout, 30 ft. long by 6 ft. 6 ins. wide, complete with wheels and axles. Particulars may be obtained at the Company's office.

Southern Mahratta Railway.—TENDERS are invited, until the 11th inst., for (1) Paints, etc.; (2) Red and White Lead; (3) Turpentine; (4) Files; (5) Miscellaneous tools and stores. Particulars (1 and 2, £1. 1s. each; 3, 4, and 5, 10s. 6d. each) may be obtained from the Company's office, 46, Queen Anne's-gate, Westminster.

FOREIGN COUNTRIES.

Egypt.—TENDERS are invited by the Egyptian Government, until the 20th inst., for the SUPPLY of STATIONERY. Particulars and samples may be examined at the Commercial Department of the Foreign Office.

COMMERCIAL LAW INTELLIGENCE.

Freight Dispute.—In the Admiralty Division, an appeal was heard from a decision of the Judge of the County Court at Cardiff. The OWNERS of the *Dowlais* (s.) sued MESSRS. BUDD & Co. for £9. 6s. 5d. balance of freight. Under a charter-party dated 12th January, 1900, plaintiffs agreed to carry for defendants a cargo of pit-props from Bordeaux to Newport on the payment of freight at the rate of 6s. 3d. per ton of 20 cwt. delivered "or on intake weight less 2 per cent. at charterers' option." The intake weight of the cargo was 1,272 tons, and the weight delivered was 1,277 tons. When the freight was paid defendants claimed to pay freight on the intake weight less 2 per cent. Plaintiffs contended that the 2 per cent. option must be declared before bulk was broken, and that as defendants had not declared it freight must be paid on the delivered weight. The County Court judge had held that the option was given for the benefit of the charterers only. He considered that defendants could not fully exercise the option until the cargo had been delivered and weighed, and that until that was done they were not in a position to know how the option could be exercised so as to give them the benefit which it was proved by the charter-party they should have. He had given judgment for defendants. Plaintiffs now appealed, contending that the judge's decision would have the effect of depriving the shipowner of his lien for freight. Their lordships dismissed the appeal with costs. Sir Francis Jeune, in giving judgment, said that in his opinion the option must be exercised when it is necessary it should be exercised, or, to put it in a more concrete way, either at the time of the tender or at the time of payment. If the lien was insisted upon, of course, he said, a tender or payment must be made, and in those circumstances necessity arises then for exercising the option, but if the lien was not insisted on then the necessity did not arise till later, namely at the time of payment. Leave to appeal was refused.

Preference Shareholders' Rights.—In the Chancery Division Mr. Justice Farwell delivered judgment in the case of *BOND v. the BARROW HEMATITE STEEL CO., LTD.*, by which the plaintiffs, who are preference shareholders in the defendant company, claimed that profits made by the company since 1898, amounting to nearly a quarter of a million, should be paid to them as dividend. Mr. Justice Farwell stated that the contention of the plaintiffs was that they were entitled by contract to be paid a preferential dividend out of the balance to the credit of the profit and loss account in each year, and that the company should not appropriate any part of such balance to reserve or carry over one shilling until they had been paid in full. He did not think that the resolutions creating the preference shares gave that class of shareholders new rights by rescinding the articles relating to declarations of dividends, formation of reserve fund, and the like. The resolutions must be read as subject to the provisions of the articles of association, and the plaintiffs' case failed.

Passengers and their Tickets.—In the Court of Session, Edinburgh, Mr. S. CUNNINGHAM sued the GLASGOW AND INVERARAY STEAMBOAT COMPANY, LTD., for £500 damages. On the 4th September last plaintiff bought two first-class tickets at St. Enoch Station, Glasgow, for the Inveraray tour from Glasgow. On the return journey on the *Lord of the Isles*, the portions of the tickets applicable to the stage between Inveraray and Greenock were collected on the steamer, and two checks marked "cabin" given to the plaintiff. Plaintiff not expecting to be asked for the checks again, did not take particular care of them, and he forgot where he put them. When the steamer arrived at Greenock plaintiff on getting on the gangway to go ashore, was asked for his tickets. He explained that he had given up his tickets, whereupon the checks were demanded. On plaintiff failing to produce these at once, he was, he alleged, violently pulled off the gangway and the steamer was started. The officials refused to allow him to land at Glasgow until he had given his name and address to a policeman. It was contended that the whole of the proceedings were malicious and unwarrantable. The jury returned a verdict for plaintiff, and assessed the damages at £150, holding that the check ticket which plaintiff had was not a receipt showing payment for his fare, and was not a substitute for his travelling ticket.

Sale of Food and Drugs Act.—In the case of *SMITH v. WIDEN AND OTHERS*, the question arose whether the sale of marmalade which contained 13 per cent. of starch glucose constituted an offence under s. 6 of the Sale of Food and Drugs Act, 1875. That section makes it an offence to sell to the prejudice of the purchaser any article of food not of the nature, substance and quality demanded by the purchaser. The evidence showed that marmalade was a preserve composed of fruit boiled with cane or beet sugar, but that there was no standard, and the recipes varied; that glucose was used by many manufacturers, and prevented the marmalade from crystallizing and prevented fermentation and mildewing, and was not injurious to health. The magistrates convicted, and the conviction was upheld by the Quarter Sessions. The Divisional Court quashed the conviction and the Lord Chief Justice said that the difference between the article demanded and that supplied must be to the prejudice of the purchaser; the object of the Act was the protection of health; in the present case the article was rather the better for the addition of the glucose.

BRITISH CONSULAR REPORTS.

Chile.—The official statistics of the foreign trade of Chile for 1900 are summarised in a report issued by the Foreign Office. Last year the trade amounted to 296½ million dollars (or pesos), or 22½ millions sterling, at the nominal exchange of 1s. 6d. per peso. This is a very substantial improvement—over two millions sterling—on the trade of 1899. The imports amounted to nearly 9½ millions sterling, and the exports to over 12½ millions, being an improvement under both heads on the previous year, but chiefly in imports. Great Britain, Belgium and Portugal are the only European nations whose imports to Chile have declined; German imports have increased considerably, as have those of the United States and France. But Australia and India have also increased their share of the import trade, the increase of Australia alone being double that of Germany, owing to the large quantity of coal (valued at £604,111 in 1900) the former sends to Chile. Wheat, copra and tallow are other important items in the trade of the Commonwealth. If the British Empire rather than the United Kingdom alone be taken, British trade with Chile has increased and not decreased. The total imports of the United Kingdom to Chile in 1900 amounted to £3,186,145, those of Germany amounting to a little over two-and-a-half millions, and of the United States to less than one million. The total for the British Empire was just under four millions sterling, or nearly half the total import trade of Chile, on which the editor of the Chilean official publication remarks:—"The result is, therefore, that the United Kingdom occupies the first place among all the providers of our articles of consumption, a pre-eminence maintained for many years, and which the efforts of the other nations have not sufficed to break down." Germany's share of the imports was 26 and the United States' share 9 per cent. of the whole. It seems, also, that the apparent decrease,

as compared with 1899, in the trade of the United Kingdom is due to a rearrangement of the statistics, whereby Australian coal, which formerly appeared under the United Kingdom, is now included with other imports from the Commonwealth. At the Buffalo Exhibition of 1901 the Chilean exhibits carried all before them amongst South American countries. They consisted mainly of wines, cognacs, furniture, textiles, drugs, hides, decorative leather, candles, parquet flooring, boots, cigars, perfumery and soaps. The main imports which show a tendency to increase are sugar, coal, cashmeres, flannels, wheat, tallow, glassware, galvanized iron, cottons, woollens, and stearine. Tea is also increasing and is ousting maté, which is the drink of the country people. It is curious to note that in spite of the heavy duty of 60 per cent. which has been imposed on certain articles for the past three years, most of these articles show a steady increase year by year. Although British trade with Chile is in a very satisfactory condition, the report gives a long list of goods in which it ought to have a larger share. It is admitted that there has been a great improvement in British methods in the last two years, especially in such matters as trade lists and the number and class of commercial travellers. The increase in the export trade is due to more nitrate being sent, and to the development of the copper industry around Coquimbo. In exports the British Empire remains pre-eminent; it took all but three-quarters of the whole last year. Nitrate absorbed three-quarters of this share, copper, chinchilla, beans, guano and wool being the chief remaining items. British trade promises to hold its own in the future in Chile; British merchants resident there do not hold the same position that they did in the old days when they had no rivals; but the German firms in the country now sell British goods, and this will probably continue so that British trade does not lose. On the other hand British merchants in the country are proving themselves fully equal to the changed requirements of the day, and there are still great possibilities for British commercial energy in the country.

France.—THE CYCLE AND MOTOR-CAR INDUSTRY IN FRANCE.—The Consul-General at Paris, in his last report on French trade, states that in 1900 the number of registered cycles in France was 975,878, of motor-cycles 11,252, and of automobiles 5,286. The department of the Seine had 212,510 cycles, 3,449 motor-cycles, and 1,436 automobiles, the Nord and Seine-et-Oise came next in importance with over 40,000 cycles each. The use of motor cars has made such strides in France in recent years that it has given rise to an important and ever-increasing industry, France being probably ahead of all other countries in this respect as well as in the numerous subsidiary industries which it creates and fosters. Of late numerous competitions have been held to popularise the use of alcohol in place of petroleum essence for propulsion, and it is thought that one result of this substitution will be an improvement in the position of the cultivators of all crops from which alcohol can be extracted. The motor race from Paris to Berlin is said to have brought orders to motor manufacturing firms in France to the value of nearly four-and-a-half millions sterling. A decree of March 10, 1899, as modified by one of September 11, 1901, governs the driving of motor-cars. The effect of these is that there must be no leakage from reservoirs containing explosive or inflammable matter; the mechanical parts must be so arranged that there is no noxious odour, and that the noise does not frighten horses; that all cars weighing more than 7 cwt. must have a reversing gear, while all cars whatever must have two separate and efficient brakes; each car is to be numbered and have a certificate from a Government engineer that it fulfils the requirements of the law; every driver must have a certificate of competency; the speed is never to exceed 18½ miles an hour in open country, 12½ in populous places, and the pace of a man on foot in encumbered and narrow passages. Every car must have a trumpet or horn and a white and green light in front. Road races can only take place by the special authority of the Prefect or Prefects, but in no circumstances is the speed in populous centres to exceed 12½ miles an hour. The regulations for the examination of drivers and for sizes of the lettering on cars are very detailed and strict, but the examiners of drivers are informed that their extensive powers should be regarded by them, not as a means of hindering a rising industry which deserves every encouragement, but of granting facilities for it, always bearing in mind the safety of the public on the roads.

FOREIGN CONSULAR REPORTS.

Demand for Pitch.—The Compagnie des Mines de la Grande Combe, 17 rue Haxo, Marseilles, state that they are desirous of receiving offers to supply about 5,000 tons of coal-tar pitch, for immediate delivery at the port of Marseilles or Cette. This company's annual needs amount to 30,000 tons. The Compagnie des Mines de la Grande Combe have heretofore placed their contracts for tar (brai) in England, and they intimate that, if American exporters can deliver this article in Marseilles or Cette for less than 47 francs (\$9.07) per ton, it will not be difficult to come to terms. These buyers supply samples to importers, and require that deliveries be in conformity therewith. This merchandise is not packed in barrels by the English exporters, but is dumped into the vessel's hold, like coal. It is probable that a freight rate about on a level with that demanded for coal could be obtained for pitch. Latest quotations for whole cargoes from the United States to Mediterranean ports are 9s. 6d. (\$2.31), and still better offers have been made quite recently. United States Consul Kehl reports from Stettin that the James Stevenson Aktien Gesellschaft, of Stettin, wish to buy coal-tar pitch. The article must be almost pure, not to exceed one-half of 1 per cent. of ash. The Consul is informed that the present supplies of the firm come from Great Britain, and the cost is about 40s. per ton c.i.f. Stettin. Correspondence can be conducted in English.

Photographic Apparatus in Brazil.—The United States Consul at Bahia reports on an opening for photographic apparatus and supplies in Brazil, stating that the camera that seems most popular is the smaller size of what is styled "cycle camera," with rapid rectilinear lens, bulb shutter and single swingback. A decided preference is shown for plate holders of metric sizes, doubtless because supplies have always been imported into Brazil in those sizes, the metric system being used there. The papers in use are gelatine printing-out paper, both plain and matte, and a quick-printing developing paper. The Consul adds that until recently the professional photographers had for the most part been using iron developers, but now they seem to have turned to metol and hydroquinone. Two are relying chiefly on pyro. The amateur uses metol and hydroquinone, either separate or combined, while a few are using glycine.

Rhodesia.—COMMERCE AND INDUSTRY.—The United States Consul at Elbenstock thus summarises the commercial possibilities of Rhodesia. Situated in the heart of the Dark Continent, bounded on every side by the colonies of Great Britain, France, Germany, Portugal, and Belgium, lies a country as yet but little known, controlled by a great stock company famed for its commercial and political enterprises in South Africa. The Chartered Company is to Rhodesia what the East India Company was once to India. Rhodesia is divided into two parts—Mashona and Matabeleland south of the Zambesi

and North-East and North-West Rhodesia north of that river. The whole country is extraordinarily rich in mineral treasures. Apart from the gold mines, which in spite of the war and scarcity of labour, yielded during 1900 nearly 166,000 ounces, there are silver, copper, tin, antimony, arsenic, lead and coal. Railroad building in Rhodesia, according to German reports, is making rapid progress. The stretch from Bulawayo northward to Salisbury will soon be completed, thus connecting Cape Town by rail with Beira, the seaport town of Portuguese Gasaland. The great Cape-Cairo railway, planned by Mr. Cecil Rhodes—an enterprise of immense importance to all Africa—will intersect Rhodesia from north to south. There are already some 3,000 miles of roadway, with intervening cart roads, built in South Rhodesia. In regard to agriculture, much remains to be done. The rich soil is eminently adapted to growing corn, oats, potatoes, tobacco, and even coffee. The vast territory adjacent to the head waters of the Zambesi and its tributaries forms the Mississippi Valley of Africa. It has a great future, and the next ten years will witness a large emigration, not only to Rhodesia, but to England's other South African colonies as well. It will be the policy of the Chartered Company and of the British Government to encourage English settlers to locate in these colonies. The discovery of gold in South Africa induced many Americans to locate on the Rand. The opening up of vast tracts of land favourable to farming may produce similar results. After the war is over, there will be a great demand for corn-planters, harrows, cultivators, reapers, mowers, hay-rakes, seeders, ploughs, disks, thrashers, corn-shellers, wagons, carriages, carts, harness, saddles, wind-mills, and every other piece of machinery or utensil necessary to run a farm. South Africa as a farming country has a future, and the British Government, from a political point of view, will make doubly welcome settlers of the English-speaking race.

Rubber Culture in Venezuela.—United States Consul Goldschmidt transmits an article published in the *Venezuelan Herald*, which, the Consul notes, is of unusual interest to all who wish to study the cultivation and exploiting of rubber, on account of the details and apparent knowledge of a subject generally very little known. The article is by Dr. Lucien Morisse, who, in the course of explorations on the Orinoco and in the district of the Rio Negro, has executed much medical and botanical work. He states that Orinoco or Ciudad Bolivar caoutchouc is exactly the same as that found on the Amazon, and known as Para caoutchouc; it is extracted from the same tree, and the method of collection is similar. The various classes of caoutchouc found in these regions are species of *Hevea*, which belong to the great family of *Euphorbiaceae*; the caoutchouc of the Orinoco is, therefore, the true *Syringa Braziliensis*. The product of the caoutchouc is everywhere the same—the Para—except, perhaps, that of Guayana, which, when the sheet is fresh, is of a bluish white; when, however, it is dry, it is impossible to distinguish it from the pure Para. These species are very different from that which comes from Africa, especially Madagascar, which is generally the product of *Ficus elastica* (a fig and not a *Hevea*), and are superior to them, Para caoutchouc being most highly esteemed and the dearest, on account of its several qualities. *Ficus elastica* is found on the Amazon and the Orinoco, and produces a milk; but, naturally, in the regions where the *Hevea* are so numerous and productive, that species is not exploited. It is curious to remark that while the *Hevea* is called *Syringa* in Brazil, it is called caoutchouc in Venezuela, where the *Syringa* is called the *Ficus*. All these various caoutchoucs, known as Para, generally reach the markets of Europe in the form of large loaves of first, second and third quality, and the residue in the shape of balls. The sap of the *Hevea* is a milk found in the bark of the tree, which ascends and descends naturally like all sap, according to the season of the year, and advantage is taken of this law to gather it by means of incisions made in the trunk, the product of which is more abundant as the incisions approach the dermis. The *Hevea*, when cut or tapped, ratoon from the foot, and those ratoon, at the end of five years, yield a product equal to that of the original tree. The Venezuelan Government forbids the natives to fell these trees; but this prohibition is altogether unnecessary, as it relates to an immense forest, measuring upwards of 30,000,000 hectares (74,000,000 acres), where caoutchouc exists in abundance, and which it would require millions and millions of hands to exploit, whereas it only contains three or four thousand Indians, not more than the tenth part of whom are engaged in the work. Fifty thousand immigrants might well be introduced for the purpose of cutting the largest number of trees possible without the least fear of destroying the forests, and the work carried on in this fashion would, in Dr. Morisse's opinion, be more efficacious and productive. On the Upper Orinoco the caoutchouc trees begin to be found in considerable numbers only below the Falls of Maipure; on the affluents of that river, to the west or the Meta, Meseta, Tomo, Chaparo, Vicheda, the Atabapo, and to the right of the Catanopo, no appreciable number is found. The Venezuelan Guayana, or Black River, contains a number of species as far as Marao; from that point they generally become rarer, but they again abound below San Carlos, and from there on they are found at varying distances all along the Rio Negro up to its confluence with the Amazon.

Textiles in Greece.—The Austro-Hungarian Consul at Piræus, Athens, writing to his Government, notes that there is a large and profitable field in Greece for the sale of textiles, the value of the imports being from 16,000,000 to 18,000,000 francs per annum. The chief demand is for the cheaper kinds of shirting and madapolams, the imports of which exceed 2,000,000 francs. Most of the demand is met by England, Austria-Hungary following with about one-fifth of the amount of England's total trade. Recently attempts have been made to place Dutch shirting, but without success. A considerable trade is also done in all-white handkerchiefs, or white with coloured borders. The trade is exclusively in English hands.

Cleveland Iron Output.—It is believed that in the year 1901 there will have been produced about 2,800,000 tons of pig iron in what is inadequately named the "Cleveland" district—the district that stretches from Skinningrove in Cleveland to Jarrow and Consett, in Durham. This vast production is less than that of the preceding year by some 6,000 tons weekly, or thereabouts. Naturally, the effect of this reduction has been felt in the Northern industries. It represents some loss of work at the iron mines (part of the iron that would have been used is imported); it indicates a much reduced use of coke; and there is also an effect on the railway traffic, so that the diminution in the production points to a considerable falling-off in the employment of labour. Nor is there any early likelihood of recovery, for at the present time, the iron manufacture cannot be said to be a very profitable one, the cost of some of the raw materials being so high. It is quite possible that we may see a further reduction of the production of pig iron in the north-east of England in the course of the next few months—unless it should be kept off by a lower range of prices for raw materials for the feeding of the blast furnaces.—*Newcastle Chronicle*.

CHAMBERS OF COMMERCE REPORTS. UNITED KINGDOM.

Bradford.—At a meeting of the Council held on the 31st December, Mr. W. B. Gordon (president) in the chair, a letter from the Huddersfield Chamber of Commerce was read asking the Bradford Chamber to support the following resolution:—"That His Majesty's Government be urged to increase the duties on all German wines, in the event of the proposed new German tariff coming into operation." The London Chamber of Commerce also wrote with reference to the proposed organisation of a National Commercial and Industrial Congress, in order to consider what recommendation should be made to the Government with respect to the tariff. It was agreed that the Huddersfield communication should be allowed to lie on the table.

The Customs authorities wrote in reply to the Chamber's request for the establishment of a local Custom-house in Bradford, stating that they were unable to make any special concessions in favour of Bradford, and pointing out that goods free of duty were examined at the port of landing, whilst dutiable goods might be removed to local bonded warehouses.

The Governing Board of the Yorkshire College wrote asking the Chamber to appoint an additional representative on the Committee for the management of the proposed higher commercial course. Mr. F. F. Steinthal was appointed.

The president, before presenting a letter which had been forwarded to the Inspector-General in Bankruptcy, said there appeared to be an impression that the Chamber were about to discuss the merits of the Goodman Root case. The Law Amendment Committee had had no such thought in their minds. Their only desire had been to discuss the abstract question of bankruptcy law, and in accordance with this they had addressed to the Inspector-General a letter (to which a confidential reply had been received) in which, after disclaiming any concern as to the case of Goodman Root, the Committee drew attention to two points suggested by the proceedings in that case. These were as to the necessity of an amendment of the law so as to penalise debtors for failure to keep proper books of account. "It has always appeared to this Chamber," the letter went on, "that in dealing with this question the Legislature would be striking at the root of most offences in bankruptcy. The Committee are now keenly disappointed to find that, in a case in which a bankrupt—after careful preliminary investigation in the Bankruptcy Court, and afterwards before the magistrates—has been indicted at the Assizes for making fraudulent entries in his books, the charge had not even been investigated by the Court. The Committee have before their minds a similar case where in the month of February, 1896, a bankrupt was charged at the Mansion-house, London, with various offences, including fraudulent entries in his books, and these charges were similarly withdrawn on the bankrupt pleading guilty to a minor count of the indictment, the bankrupt being then sentenced to come up for judgment when called on. The Committee feel very strongly that such treatment of charges of this nature is likely to create the impression that the fraudulent manufacture of accounts is not regarded as an offence of any gravity. The Committee feel that the effect will be most demoralising if it becomes generally understood that a debtor may keep his books as fraudulently as he likes, so long as he takes care to refrain from making false entries, or makes none at all, for four months, and staves off his bankruptcy for that period."

The Committee desired to see some steps taken the effect of which would be to penalise bankrupts who have not kept proper books of account. They further thought that some steps should be taken to secure that offences under the Debtors Act shall be thoroughly investigated, and to extend the period of limitation beyond which such offences can be punished. They added that they thought of placing a resolution on the agenda for the next meeting of the Association of Chambers of Commerce, but first asked for the Inspector-General's opinion on the subject. The matter was not further referred to, but at a later stage of the meeting it was decided to forward the following resolution to be placed on the agenda of the forthcoming meeting of the Associated Chambers:—

"That the present state of the law as to the punishment of fraudulent bankrupts is unsatisfactory, and that the Executive Council be requested to consult the various Chambers of Commerce in the Association, with a view to a bill being introduced into Parliament to amend the existing law."

Other resolutions for the meeting of the Associated Chambers adopted by the Council were for the extension of the jurisdiction of County Courts so as to make it unlimited (subject to proper power of removal to the High Court), or in the alternative the establishment of no lower limit of jurisdiction than £500; and for the adoption of a uniform halfpenny inland postage for all matter enclosed in open envelopes or wrappers.

Cardiff.—THE ROYAL COMMISSION ON COAL.—At a recent meeting of the Cardiff Chamber of Commerce, the following resolution was passed:—"That this meeting of the Cardiff Chamber of Commerce, deeming it certain that questions affecting the export of coal will engage a large share of the attention of the recently-appointed Royal Commission, deeply regrets the inadequate representation, especially as regards South Wales, of the exporting interest on the Commission, and is of opinion that the findings of the Commission will not command the confidence they otherwise would." Mr. W. H. Lewis, president of the chamber, said he found that last year the South Wales district had 41½ per cent. of the foreign coal export of the country. The Commission contained one coal exporter only, and that one from the north. Mr. John Andrews, who proposed the resolution, said the idea which had been expressed by the Chancellor of the Exchequer, and which had got a firm hold of the country, that it might be a good thing to restrict export of coal, constituted a grave danger and meant disaster to the exporting and shipping interests of the country. Mr. D. A. Thomas, M.P., said it was a commercial question affecting Cardiff more than any other port in the kingdom. For several years the Government had been pressed to appoint a Royal Commission on the coal supply, and had consistently declined to do so until after the coal tax was imposed, when a promise was given. This showed that the tax and the question of exports were really the origin of the Commission. Not only had South Wales been ignored, but the whole commercial element. He questioned whether there was any precedent for the addition of a member to a Royal Commission, and if there were he doubted that the Chancellor of the Exchequer would favour the appointment. In the House of Commons he had urged the Government to see that the commercial element was adequately represented on the Commission, and a member of the Government then asked what was meant by "the commercial element." He might mention incidentally that he would take the earliest opportunity of moving the House of Commons to do away with the Board of Trade and its president, and asking for the appointment of a Ministry of Industry and Commerce, with a Minister who should have the status of a Secretary of State.

Dundee.—At a meeting on the 26th Dec. last, the president (Mr. David Macintyre), in reviewing the work of the past year, said reference was made to the circular which had been received from the Advisory Committee of the Board of Trade, requesting information in connection with the new German tariff. The opinions then expressed were kept in view in the reply given to

the Government, and were embodied in the report on the articles in which Dundee was specially interested. An assurance had been received in reply that the various points raised would have the careful attention of the Committee. The revision of the Spanish tariff, which was soon to engage the attention of the Spanish Government, gave an opportunity of again representing the exceptional rate of duty levied on the yarns of this district, more especially the heavier sizes of linen yarns. In the tariff of 1892 the rate of duty on these yarns was altered from 27½ to 45 pesetas per 100 kilogrammes. The result of that change had been not only to restrict the exports to Spain very seriously, but also to greatly hamper the weaving industry in that country. The linen manufacturers in Spain who used that class of yarns had felt the disadvantage of the high duty so much that they were now petitioning their Government for a return to the former rate—or to a still lower one. The Directors had placed all the facts bearing on the subject before the Government, and they had the satisfaction of knowing that His Majesty's Ambassador at Madrid had been instructed to take such action as might be in his power in the matter.

It was customary at the closing meeting of the year to refer to the main features of the trade, so far as its volume and value were concerned. Compared with the preceding year the importations of raw material showed an increase all round. Imports of flax and tow from 1st January, 1901, to this date had been 18,400 tons, and hemp and hemp codilla 2,090 tons, an increase of 4,000 tons of flax over the imports of 1900, hemp showing no difference. Imports of jute for the year amounted to 200,000 tons, compared with 186,000 tons in 1900, an increase of 14,000 over last year. In exports the figures testified to the restrictive production which had marked the linen trade this year. During the eleven months from the 1st January to 30th November, 11,864,000 lbs. of linen yarns, of the value of £754,000 sterling were exported, as compared with 15,000,000 lbs. —value £853,000 sterling—exported in the corresponding period of 1900, a decrease for 1901 of 3¼ million lbs. of yarn and £99,000 value. The decrease applied to all countries to which linen yarns were exported. Linen cloth had been exported to the extent of 135¼ million yards, valued at £3,350,000, as against 143 million yards, valued at £3,550,000, for the same period in the previous year, a decrease of 7¼ million yards and £200,000 value. The United States of America showed an increase of 5 per cent. and the Republic of Colombia an increase of 100 per cent. With these exceptions all other countries had taken smaller quantities of linens this year than in 1900. In jute manufactures, on the other hand, the volume of trade had been larger this year than in 1900. Jute yarn exports for the eleven months of this year had amounted to 39¼ million lbs., valued at £471,000 sterling, as compared with 35¼ million lbs., valued at £450,000 for the same period in 1900, an increase of 3¼ million lbs. of yarn and £21,000 value. Of jute cloth for the same periods the exports had amounted to 200 millions of yards, valued at £1,985,000, in 1901, compared with 157 millions of yards, valued at £1,706,000, in 1900, an increase of 43 millions of yards and £279,000 value. Three-fourths of that increase had been to the United States of America and the remainder to the Argentine Republic, Brazil, and Canada. The value of jute manufactures imported from abroad was almost exactly the same as in 1900, viz., £2,015,000. These were again exported to the extent of £1,677,000, leaving a value of £338,000 sterling as the apparent home consumption of jute cloth manufactured abroad. The corresponding figures for 1900 showed that the apparent home consumption in that year of jute goods manufactured abroad was £500,000. The high prices which were current for flax at the beginning of this year continued until towards the closing months, when the promise of a more abundant supply exercised a downward influence on prices, with a somewhat more hopeful prospect for the trade. The demand for linen goods had not been equal to the average. It had, however, been materially assisted by the requirements of the Government, but as yet there was not full employment for the looms. For the first half of the year prices of jute were firm, and gradually advanced until the opening of the new season. Thereafter, under free selling and the issue of the Government forecast, values gradually receded, but the market had again stiffened to some extent. All concerned were waiting with interest to see if the supply for the next few months would justify the expectations which had been formed as to the extent of the crop. It was always difficult to forecast the prospects of the jute trade, which from time to time underwent many fluctuations. There was no apparent reason for a desponding outlook at present, but it must be kept in mind that the legislature had decreed that the production was to be lessened after 1st January next to the extent of nearly one week in the year, and that Dundee would be to that extent handicapped in competition with other countries for supplying the markets of the world.

The President concluded by referring to the inconvenience which the trading community had suffered through the breakdown in the telegraph service throughout the country. This had been so severely felt lately that they could not allow the matter to sleep. The matter should be pressed on the attention of the Government, and they should avail themselves of the opportunity of united action with other Chambers of Commerce in this important matter.

Leeds.—At the monthly meeting on December 31, attention was given to subjects to be considered at the meeting of Associated Chambers next month. One of these related to the recent interruption in telegraphic communication on account of recent storms. The secretary (Mr. R. K. Calvert) remarked that two or three other Chambers had taken the matter up, and were proposing resolutions for the meeting of Associated Chambers. Liverpool and Edinburgh had both drafted resolutions, and, in the circumstances, it was not thought necessary to duplicate them, if they met the view of the Leeds Chamber.

The president (Mr. G. R. Portway) thought they could decide later which resolution they would give preference to. The secretary read the resolutions passed by the Edinburgh and Liverpool Chambers, as follows:—

Edinburgh.—That whereas the frequent breakdown of the telegraphic system of the country is a great disadvantage and loss to all classes, and past experience proves that no remedy is to be found for these periodical stoppages except the substitution of underground trunk lines for the present overhead system, this Association resolves that the Postmaster-General be again urged to proceed without further delay with the completion of the underground system between the main centres of commerce, and that the Executive Council be requested to arrange for an influential deputation to wait upon the Postmaster-General with this object.

Liverpool.—That in view of the great disorganisation and prejudice to business resulting from the recent stoppage of telegraphic communication within the United Kingdom, owing to the destruction by storm of the overhead telegraph wires, this Chamber is strongly of opinion that steps should be taken immediately by the Postmaster-General to place wires underground in sufficient number for emergency purposes, between London, Liverpool, and other important commercial centres of the kingdom.

The president said they had all seen the reply of the Postmaster-General to the Liverpool deputation. It seemed very largely a question of expense. The breakdown had been felt very seriously in Leeds, and they regarded it as an intolerable

interruption to business. The question of expense, whilst it might be seriously considered, was one that should not outweigh a great public improvement and the need for regular communication. It had been established that underground wires could do their work without any such risk of disorganisation as affected the overhead wires, and in the interests of commerce they ought to put pressure on the Government to get an extension of the underground system. The Government needed the commercial community behind them to make them do what they now thought they could not do. It was decided to support one or other of the resolutions at the meeting of the Associated Chambers. It was also agreed to send a communication to the Postmaster-General pointing out the great inconvenience suffered in Leeds through the recent collapse.

In answer to a communication from the Chamber, in which they sought an expression of opinion in favour of the compulsory adoption of the metric system, replies were received from all the local members of Parliament, except Mr. Lawson Walton, K.C., and Mr. Whiteley. Mr. G. W. Balfour, President of the Board of Trade, wrote—I am afraid my reply must be that, while recognising the many advantages of the metric system, I am not prepared, as head of the department which would have charge of any legislation dealing with the subject, to say that the time has come when the system could be advantageously enforced by a compulsory measure. Mr. W. L. Jackson replied—I think that in some branches of trade there is a growing opinion that the metric system would be an advantage; but I feel some difficulty as regards the compulsory adoption of the system, and I incline to think that it would be better to wait a little and see whether under the permissive system the movement makes any practical headway. Mr. H. S. Cautley answered that he was quite willing to add his name to the list of members of Parliament who are in sympathy with the compulsory adoption of the system; and Mr. Herbert Gladstone replied that he had sent in his name to the Decimal Association as a supporter of the system.

One of the subjects the Leeds Chamber proposes to bring before the meeting of Associated Chambers relates to reform of Parliamentary procedure. The united Chambers will be asked to say that an amendment of the present system of transacting both public and private business by Parliament is urgently required in the interest of commercial and other beneficial legislation, and putting forward suggestions for the re-arrangement of business and an extension of the principle of devolution.

On the motion of the president, Mr. Robinson was appointed a second representative of the Council on the committee for the management of the higher commercial course at the Yorkshire College.

Liverpool.—At a meeting of the African trade section of the Chamber, on the 21st ult., Sir A. L. Jones presiding, a reply was read from the Colonial Secretary's office at Lagos to a communication from the section, to the effect that the Governor was not prepared, without first receiving an order from the Secretary of State, to abolish any dues during the present financial year. The question of the advisability of their maintenance or abolition had been considered, and his Excellency's views had been communicated to the Secretary of State. The Government understood that the general consensus of opinion in Lagos favoured the maintenance of transit duties, and it had been pointed out to the Secretary of State that the Liverpool Chamber of Commerce had in that and all similar recommendations refrained from suggesting any substitute tax. Complaints received from West African gold-mining companies as to delay with the concessious work of the Gold Coast Court had been forwarded to the Colonial Office. Mr. Chamberlain replied that the matter was receiving his attention, and he promised a further communication on the subject. A scheme of Lieutenant-Colonel Lamprey, R.A.M.C., for providing light ambulance trains in the West African colonies had also been forwarded by the section to Mr. Chamberlain, who had replied that he was bringing the matter under the notice of the Governors of the Gold Coast, Sierra Leone, and Lagos.

GENERAL INTELLIGENCE OF THE PAST MONTH.

January, 1902.

UNITED KINGDOM.

JAN. 1st. : The Incorporated Society of Musicians held their annual meeting. Mr. J. H. Arkwright was appointed Lord Lieutenant of the county of Hereford. Death of Dr. John Birrell. Mr. John Redmond, M.P., addressed a Nationalist demonstration at Sligo.

2nd : Riots took place at Bethesda of strikers at the Penrhyn quarries. A donation of £200,000 was placed at the King's disposal by Sir E. Cassels, for charitable purposes. The National Federation of Head Teachers' Association opened their annual conference at Newcastle-on-Tyne.

3rd : The Marquis Ito was entertained at luncheon by the Lord Mayor of London. Death of Sir J. Parker Deane. Death of Prebendary Tucker.

4th : The King decided to devote Sir E. Cassel's gift to the provision of sanatoria in England for the cure of tuberculosis.

6th : Mr. Chamberlain addressed a meeting of the West Birmingham Relief Fund promoters. The King conferred the order of G.C.B. on Marquis Ito. Lord Londonderry spoke at a Unionist meeting at Chester. Death of Admiral Sir E. S. Sotheby, K.C.B. Death of Sir James Chance.

7th : Prebendary Hannah, vicar of Brighton, was appointed Dean of Chichester. Lord E. Grey addressed a meeting at Newcastle-on-Tyne on the public situation. Death of Mr. John Brett, A.R.A.

8th : The Lord Chancellor spoke at the centenary banquet of the Liverpool Underwriters' Association. Mr. Chamberlain presided as Chancellor at the Annual Court of the Governors of Birmingham University. A large convention of the United Irish League was held in Dublin. Death of Mr. Edwin John Beale.

9th : The Association of Head Masters opened their annual meeting at the Guildhall. A Conference of Science Teachers was opened at Chelsea. The Nationalists held a conference in Dublin. Death of Sir Thomas Lea.

10th : Mr. Balfour addressed his constituents at Manchester. Mr. E. B. Hoare resigned his seat as M.P. for Hampstead.

11th : Mr. Balfour was entertained at luncheon by the Manchester Conservative Association. Mr. Chamberlain spoke at the annual dinner of the Birmingham Jewellers' and Silversmiths' Association.

13th : The King and Queen returned to London from Sandringham. Sir H. Campbell-Bannerman presided at the inaugural meeting of the London Liberal Federation. Lord Henegau withdrew from the Liberal Unionist Association. 51 fresh cases of small pox were reported in London.

14th : The King and Queen visited the Albert Chapel in Windsor Castle, on the anniversary of the death of the Duke of Clarence. The Army Rifle Association held their annual meeting. It was proposed to found a British Academy. A conference on Old Age Pensions was held in Memorial Hall.

15th: The King inspected drafts of the Foot Guards proceeding to South Africa. The Archbishop of Canterbury presided at a meeting of the National Society. Death of Lord Rookwood.

16th: The King, accompanied by the Queen, opened Parliament. At the Court of Common Council at the Guildhall it was resolved to present Mr. Chamberlain with an address.

17th: The Queen Victoria Memorial Fund amounted to £187,000.

18th: Princess Louise and the Duke of Argyll visited the Alexandra Palace. Conference of Public School Science Masters was held. Death of Sir E. Ashmead-Bartlett, M.P.

20th: Mr. A. J. S. Milman, late principal clerk of the House of Commons, was appointed a K.C.B. Sir Joseph Walton was elected a member of the Senate of the London University. Death of Mr. Aubrey de Vere.

21st: In the House of Commons, in the debate on the Address, an amendment censuring the Government in the conduct of the South African War was rejected by a majority of 210. The King arrived at Windsor Castle from Penn House, Bucks.

22nd: The King, Queen, and other members of the Royal Family, attended a memorial service in the Frogmore Mausoleum on the anniversary of the death of Queen Victoria. The anniversary of the accession of King Edward was commemorated. The confirmation of Canon Gore as Bishop of Worcester took place.

23rd: Colonel Sir J. Willcocks left Southampton for South Africa. Death of Dr. F. G. Lee. Death of Sir W. Biddulph Parker.

24th: The Prince of Wales left London for Berlin. Mr. T. Milvain, K.C. (C.), was elected M.P. for Hampstead, in place of Mr. E. B. Hoare. It was officially announced that the Royal Procession through London will take place on June 27.

25th: The consecration of the Rev. G. Trower as Bishop of Likoma, and of the Rev. E. H. Elwyn as Bishop of Sierra Leone, took place in Westminster Abbey. No news was received of the missing sloop *Condor*. Commander A. I. Loane, R.N., was appointed Captain-Superintendent of the *Exmouth*. Death of Professor A. B. Davidson.

27th: At a town's meeting held in Liverpool it was resolved to establish a University for the city. In the House of Lords a resolution was passed approving the action of the Government in the war in South Africa. The annual conference of the South Wales Miners' Federation was opened at Cardiff.

28th: Mr. W. Runciman (L.) was elected M.P. for Dewsbury. In the London County Council it was resolved to issue a loan of £3,000,000 Consolidated 3 per cent. stock at £98. 10s.

29th: The King and Queen returned to Marlborough House from Windsor Castle.

30th: The Prince of Wales returned to London from Germany.

COLONIES.

Australia.—14th: In the Federal House of Representatives, a resolution was passed repudiating the calumnies on the British army, and promising further aid to end the war in South Africa.—23rd: A further contingent of 1,000 men for South Africa was authorised. **New South Wales.**—13th: Owing to the indisposition of Sir F. Darley, the Lieutenant-Governor, Mr. Justice Owen was appointed Deputy Lieutenant-Governor.—21st: Three special commercial representatives were appointed for London, Japan, and South Africa. Mr. C. C. Lance, manager of the Fresh Food and Ice Company, was selected as commercial agent in London.—30th: Vice-Admiral Sir Harry H. Rawson was appointed Governor of the State. The Right Rev. C. G. Barlow, Bishop of North Queensland, was elected Bishop of Goulburn. **Queensland.**—25th: The State elections were fixed for March 11. **Western Australia.**—15th: Parliament re-assembled. The Leake Government had a majority of three in the Lower House.

New Zealand.—17th: A patriotic meeting at Wellington passed resolutions approving the British conduct of the war in South Africa, and Mr. Chamberlain's refutation of foreign slanders.—21st: A ninth contingent of 1,000 men was proposed to be sent to South Africa.

British West Africa.—12th: It was announced that Colonel Festing's force had captured Soko; many submissions were made and a market opened in the capital.—16th: The Aro power was completely broken up.

Canada.—4th: M. Marconi decided to set up a trans-Atlantic wireless telegraph station on the Cape Breton coast.—11th: Death of the Hon. R. Dobbell.—14th: The Canadian Mounted Rifles left Halifax for South Africa. Sir Wilfrid Laurier was invited to the coronation of King Edward.—16th: Mr. James Sutherland was sworn in as Minister of Marine in succession to Sir L. Davies, appointed a Justice of the Supreme Court. Death of Chief Justice McCall.—18th: The mineral production of British Columbia for 1901 was estimated at \$20,713,501, an increase of 25 per cent.—28th: Three more squadrons of the Canadian Mounted Rifles left Halifax for South Africa.

Cape Colony.—1st: The new line of blockhouses from Beaufort West to De Aar was completed.—4th: General Baden Powell was presented with an address at Middelburg.—14th: Parliament was prorogued till March 4.—18th: Commandant Scheepers was executed at Graaf Reinet.

Malta.—4th: A petition was presented by the Archbishop and the Chapter of the Cathedral against the substitution of the English for the Italian language, and the imposition of new taxes.—28th: Mr. Chamberlain announced in Parliament that Italian would be retained as the official language of the Courts, and that the proposal that English should be adopted was withdrawn.

Newfoundland.—29th: The Government agreed to the renewal of the *modus vivendi* with reference to the French shore for another year.

Orange River Colony.—6th: General passenger traffic on the railway was resumed.—9th: General Elliot's columns pursued De Wet's force towards Heilbron.—11th: De Wet was baffled in his attempt to cross the railway.

Transvaal.—3rd: The Johannesburg *Star* re-commenced publication. General Botha circulated a request to the Boer commandants to continue fighting.—4th: General Opperman was killed in an engagement with General Plumer's force.—9th: Lord Milner was entertained at a banquet by the Johannesburg Municipal Council and the Chambers of Mines and Commerce.—10th: A Boer laager at Boschman's Kraal was captured.—11th: Colonel Wing captured a laager near Ermelo, taking 42 prisoners.—17th: Dr. Visser was convicted at Johannesburg of treason and breaking the oath of neutrality.—20th: Lord Methuen's force captured a Boer laager near Boschpoort.—25th: General B. Viljoen was captured at Lydenburg. General Vilonel received permission to raise a corps of 1,500 burghers.—27th: Large captures of Boers were reported.

INDIA.

7th: The Viceroy reported the number of persons in receipt of famine relief to be 140,000.—13th: The number of British soldiers who re-engaged for further service in India was stated to be 16,662.—17th: The Government issued a resolution dealing with recent attacks on the land reserve system.—22nd: A public

meeting of merchants and others interested in the tea industry was held at Calcutta.—26th: The number of persons in receipt of famine relief rose to 208,000.—27th: The Viceroy appointed a Commission to visit the Universities and Colleges of India and enquire as to their working.

FOREIGN COUNTRIES.

Argentine Republic.—4th: It was reported that the dispute with Chile had become aggravated; and it was proposed to break off negotiations.—8th: It was stated that the incidents with Chile were closed satisfactorily.

Austria-Hungary.—23rd: The Archduchess Elizabeth Maria of Austria was married to Prince Otto of Windischgratz.

Belgium.—1st: The population of Belgium was stated to be 6,693,000.—3rd: A Bill to make Sunday labour optional was proposed to be introduced.—14th: A Bill was introduced into the Chamber to indemnify Ostend and Spa for the suppression of the casinos.—20th: The Sugar Conference re-assembled at Brussels.—23rd: The Sugar Conference at Brussels discussed the bounties question.—24th: The Government Military Reform Bill, providing for the reduction of the term of service and an increase of 20 per cent. on the effective strength, was passed by the Chamber.

Bulgaria.—3rd: A new Cabinet was formed under M. Danef.—5th: The Solbranje rejected the Ministerial demand for supplies for two months, and was dissolved.

Chile.—2nd: It was announced that the peace protocol had been accepted by the Argentine Government. The calling out of the Chilean reserves was postponed.—3rd: An internal loan of £3,000,000 in 7 per cent. bonds was proposed.

China.—3rd: The Court arrived at Pao-ting-fu.—7th: The Court made a magnificent state entry into Peking. The Emperor and Empress-Dowager were attended by 1,000 Chinese nobles.—10th: Chang-Po-hoi was appointed Minister of Education; Wang Wen Shao, Director of the Board of Railways and Mines, and Yuan Shih-Kai was nominated Director-General of the Peking-Shan-hai-Kwan railway.—22nd: The Foreign Ministers presented their credentials to the Emperor and Empress-Dowager.—23rd: The Nan-king and Wu-chang Viceroy's were ordered to Peking. Yuan Shih-Kai urged the necessity of reforms.—25th: It was stated that a treasure of one hundred million taels was found intact in Peking where it was buried before the flight of the Court. The Court granted to Yuan Shih-Kai a sum of five million taels annually for the maintenance of an army of 100,000 men in the province of Chih-li.

Colombia.—20th: The revolutionary gunboats attacked the Government vessels in Panama Bay. Dr. Alban, the Governor of Panama, was killed.

Congo State.—8th: A commercial treaty was signed with France.

Cuba.—21st: It was announced that Señor T. E. Palma was elected President of the new Republic of Cuba.

Denmark.—13th: A deputation waited on the King with a monster petition against the sale of the Danish West Indies unless the islanders wished.

France.—14th: M. Paul Deschameli was re-elected President of the Chamber of Deputies.—18th: The Paris Municipality decided to grant to a company a 50 years' monopoly of the gas supply.—22nd: The Chamber of Deputies adopted a Bill abolishing the drawback of 14 per cent. on the sugar extracted from molasses.—28th: The Chamber adopted a Bill for expending about 600,000,000f. on canals and waterways.

Germany.—6th: The German Ambassador to London, Count Wolff Metternich, was entertained at luncheon by the Senate of Hamburg.—8th: The Reichstag re-assembled, and the Prussian Diet was opened.—11th: It was announced that Prince Henry of Prussia would attend the ceremony of the launch of the Emperor's new yacht at New York.—14th: Prince Henry of Prussia was named to represent the German Emperor at King Edward's Coronation.—25th: The Prince of Wales arrived in Berlin and was received by the German Emperor.—26th: The Prince of Wales was appointed Chief of the Deutzer Cuirassiers.—27th: The birthday of the Emperor William was celebrated in Berlin.—28th: The Prince of Wales left Berlin for Neustrelitz.

Holland.—11th: Death of Prof. Cornelis Petrus Tiele at Leyden.

Japan.—5th: The question of the purchase of the railways by the Government was revived.

Norway.—11th: The new State Loan of 35,000,000 kroner was concluded.

Paraguay.—10th: The Presidential election caused a revolution. President Aceval resigned. The revolutionary party supported the candidature of Señor Guillermo Rios for the Presidency.

Persia.—3rd: It was reported that the Sultan of Nijd was marching on Koweit.

Portugal.—2nd: The Cortes was opened by the King in person.

Russia.—7th: Death of M. de Bloch, Councillor of State.—14th: The Budget for 1902 showed a deficit of 143,987,494 roubles.

Spain.—15th: The labour difficulty at Barcelona became more acute.—22nd: The Finance Minister introduced a Bill in the Chamber establishing in the Bank of Spain a separate department of note issues.

Switzerland.—3rd: It was reported that 6½ miles of the Simplon tunnel were completed.

Turkey.—1st: The Embassies protested against the exaction of the Salonika quay dues, without the previous consent of the Powers.—15th: The provisional Baghdad railway convention was agreed to.—15th: The periodical instalment of the Russian war indemnity, £1350,000, was paid into the Ottoman Bank.—17th: An Irade was issued authorising the signature of the Baghdad railway convention.—23rd: The Baghdad railway convention was signed.

United States.—4th: It was notified that the Panama Canal Company offered to transfer all its properties and concessions for £8,000,000.—7th: A Bill was introduced into the New York State House of Assembly making it treason with death penalty, for any attempt on the life of the President, or of the Governor of New York State.—8th: Mr. Payne was appointed Postmaster-General; Mr. Shaw, Secretary to the Treasury; and Mr. John Crossland, Minister to Liberia.—9th: The Nicaragua Canal Bill passed the House of Representatives. A mass meeting of sugar planters was held in New Orleans with regard to the proposed concession to the Cuban cane-sugar growers.—11th: Mr. Croker retired from the leadership of Tammany Hall.—14th: Mr. Whitelaw Reid was appointed Special Ambassador for King Edward's Coronation.—18th: The report of the Isthmian Canal Convention was said to favour the Panama route.—21st: Mr. Croker left New York for England. The 25th annual meeting of the New York State Bar Association was held.—24th: The treaty for the sale of the Danish West India Islands to the United States was signed.—28th: Death of Rear-Admiral L. A. Kimberley.

Venezuela.—2nd: President Castro stated that the revolutionary rising was crushed. A New York despatch asserted that the revolutionists had received large supplies of arms and ammunition, and that the rising was extending.—18th: It was reported that the revolutionists under Cedeño had twice defeated the Government troops, and that a new rising had broken out near Carupano under General Vasquez.

FORTHCOMING EVENTS.

UNITED KINGDOM.

Dublin.—The Lord Lieutenant will hold a *LEVÉE* at Dublin Castle on the 4th inst.

Birmingham.—On the 8th inst. Mr. Chamberlain will preside at the annual court of Birmingham University.

London.—On the 5th inst. will be held the SPEAKER'S full-dress Parliamentary DINNER to the members of the Opposition. On the same date the CHAMBER OF SHIPPING of the United Kingdom will hold a business meeting and a dinner. On the same evening Mr. Herbert T. Thomas will lecture on "JAMAICA" at the Society of Arts.—On the 6th inst., at the Society of Arts, Professor W. R. Dunstan, F.R.S., will read a paper on "THE COAL RESOURCES OF INDIA."—On the 7th inst. Professor E. Ray Lankester will read a paper at the Royal Institution on "THE NEW MAMMAL FROM CENTRAL AFRICA and other Giraffe-like animals."—On the 10th inst., at the Royal Geographical Society, the Rev. Thomas Lewis will lecture on "THE ANCIENT KINGDOM OF KONGO."—On the 11th inst., at the Whitehall-rooms, the Hon. J. H. Turner will deliver a lecture on "BRITISH COLUMBIA OF TO-DAY."—On the 18th inst., at the Society of Arts, a paper will be read by Mr. W. T. R. Preston on "THE FRENCH-CANADIAN RELATIONSHIP TO THE CROWN."—On the 24th inst. a paper will be read at the Royal Geographical Society on "THE VOYAGE OF THE ANTARCTIC SHIP 'DISCOVERY' TO NEW ZEALAND."

Portsmouth.—NAVAL AND MILITARY EXHIBITION.—The Central News says a large naval and military exhibition will be held at Portsmouth during next June, July, and August. Among those who have given their patronage to the enterprise are the Prince and Princess of Wales, the Duke and Duchess of Connaught, Earl Selborne, First Lord of the Admiralty, Mr. St. John Brodrick, Secretary for War, and a large number of distinguished naval and military officers. The profits will be devoted to naval and military charities.

FOREIGN COUNTRIES.

Austria-Hungary.—The INTERNATIONAL FISHERY EXHIBITION to be held at Vienna will be open from the 6th to the 21st September next. The exhibition will include everything connected with the fishing industry, even to the preservation and transport of fish, both living and otherwise. Articles intended for exhibition will be allowed to enter Austro-Hungarian territory free, and will have the advantage of a reduced tariff on the railways.

France.—An INTERNATIONAL COMPETITION will take place at Paris in May next for motors and apparatus using denatured alcohol for the production of motive power, of light and of heat. The competition will be followed by a public exhibition to be held from the 24th May to 1st June. All motors and apparatus using denatured alcohol in any way, whether taking part in the competition or not, will be admitted to the exhibition; also apparatus for producing industrial alcohol, the receptacles for warehousing and transporting the product, the apparatus worked by exposed motors, denatured alcohols and their compounds. Requests for space and permission to exhibit will be received up to the 15th April.

Germany.—An EXHIBITION of the ALCOHOL INDUSTRY, especially with regard to the industrial applications of alcohol, will be opened at Berlin under the auspices of the Association of German Distillers on the 8th inst., and will remain open till the 16th.

Italy (Mantua).—An INTERNATIONAL EXHIBITION of CHEESE will be opened at Mantua, on the 18th May next, under the auspices of the Agricultural Co-operative Association of that town. The exhibition will comprise the machinery and instruments used in the manufacture and the preservation of cheese, as well as products of the cheese trade properly so called.

Russia.—The INTERNATIONAL SPORTING EXHIBITION, which is to be held at St. Petersburg in May and June next, will include automobiles (motors, etc.), velocipedes, their parts and appurtenances; aeronautic appliances of all kinds; saddlery goods, etc.; rowing and sailing boats and appliances; games; also fencing, boxing, and gymnastic properties; fire-arms and appurtenances; photography and all appertaining to it. Each section will be complete in itself. As far as possible Russian sporting clubs and societies are invited to contribute to make the exhibition fully representative of Russian sport. Foreign exhibitors will also participate. Exhibits and articles in general connected with sport can be sold at the exhibition.

NAVAL AND MILITARY INTELLIGENCE.

NAVAL.

Mr. Philip Watts's appointment as Director of Naval Construction is to date from February 1.

The large straight tube type of Yarrow boiler has been selected for the five armoured cruisers.

The *Irresistible*, battleship, will be commissioned at Chatham early in February for service on the Mediterranean Station.

The *Espiegle*, sloop, was commissioned on January 21 by Commander E. G. Barton for service on the China Station.

The destroyer *Dasher* has been selected to commission to replace the damaged destroyer *Salmon* in the Medway flotilla.

The good service pension vacant by the death of Admiral Sir George Elliot has been conferred upon Admiral Sir John Hopkins.

The *Melita*, sloop, Commander Ian M. Fraser, D.S.O., which recently returned to Devonport from the Mediterranean Station, paid off on the 17th ult.

Rear-Admiral T. S. Jackson, who has been promoted to Vice-Admiral, will complete his term of three years' service as Superintendent of Devonport Dockyard and will vacate the appointment on July 7.

Rear-Admiral Sir Baldwin Walker will hoist his flag on board the *Resolution* on February 10, from which date the battleship will be the second flagship of the Reserve Squadron, in the place of the *Sans Pareil*.

The good service pension of £150 a year, vacant in consequence of the promotion of Captain John Durnford, C.B., D.S.O., to the rank of Rear-Admiral, has been awarded to Captain George A. Giffard, R.N.

Captain Henry B. Jackson, R.N., has been appointed Assistant-Director of Naval Ordnance from February 10, on Captain George Le C. Egerton, R.N., C.B., vacating the appointment of Assistant-Director of Torpedoes.

It has been officially announced at Chatham that the Princess of Wales has graciously undertaken to name the new battleship *Prince of Wales* on the occasion of the vessel being launched on Tuesday, March 25. The first keel-plate of the new battleship was laid down last March.

During the next cruise of the Channel Squadron, experiments are to be made with Scottish coal and with patent fuel made from the dust of Welsh coal. On the following cruise two battleships are to make experiments with oil fuel, which has

already had a protracted trial in the *Surly*, torpedo-boat-destroyer, at Portsmouth.

An official intimation was received at Devonport yesterday that the King and Queen will visit the port and attend the launch of the battleship *Queen* on March 10; also that Her Majesty has graciously consented to name the vessel. During their visit to the west their Majesties will lay the foundation stone of the Royal Naval Cadets' College, Dartmouth.

The *London*, battleship, has concluded a 30 hours' coal consumption trial at one-fifth her power. She drew 26 ft. 3 ins. forward and 27 ft. aft, and had a steam pressure of 248 lb. in her boilers. The vacuum was 27.6 in. starboard and 27.3 in. port, and the revolutions were 65.68 starboard and 65.26 port, produced by a collective i.h.p. of 3,237. The speed was 11½ knots, and the coal consumption 1.81 lb. per i.h.p. per hour.

The Portsmouth Dockyard authorities have been directed to prepare estimates for fitting out the *Active*, cruiser, to relieve the *Urgent*, Captain D. Riddell, as receiving ship at Jamaica. The *Active* was last employed as Commodore ship of the Training Squadron, and when she had been dismantled for a refit the Training Squadron was abolished and the Cruiser Squadron substituted.

The *Amphitrite*, cruiser, Captain W. Stokes Rees, C.B., at present employed on naval relief duties, is ordered to be commissioned for service on the China station on her return to Chatham Dockyard with the paid-off crews of the *Alacrity*, despatch vessel, Commander Seymour E. Erskine, and the *Snipe*, shallow draught steamer, Lieut. and Commander Robert W. Dalgety. The *Amphitrite* will be manned by a new crew from the Medway depot.

The Admiralty have issued to Clyde shipbuilders specifications for two battleships, five armoured first-class cruisers, and two protected deck third-class cruisers. The battleships will be of 16,500 tons displacement, and the most powerfully armed in the world. The Admiralty ask that the tenders for the battleships be pushed forward, so that the contracts may be placed expeditiously. The third-class cruisers will have 3,000 tons displacement, so as to admit of greater gun power.

The *Pantome*, sloop, has returned to Sheerness from a 30 hours' steam trial at 5.7ths of her full power, which proved successful. The following are the particulars of the trial:—Pressure of steam in boilers, 216 lb.; ditto at engine, 209 lb.; vacuum—starboard, 27.7 ins.; port, 27.2 ins.; revolutions—starboard, 178.9; port, 175.6; i.h.p.—starboard, 158; intermediate, 170; low, 183; port, high, 165; intermediate, 167; low, 177; total i.h.p., 1,020; speed, 12.5 knots; coal consumption, 1.54 lb. per i.h.p. per hour. The results were considered very satisfactory. She is fitted with engines made in Devonport Dockyard, and her boilers are of the Niclausse watertube type, supplied by Messrs. Humphrys, Tennant, and Co.

At Whale Island, on the 10th ult., a sample 2-in. plate manufactured by Messrs. Cammell and Co., of Sheffield, of the type used in gun shields and in continuation of the armour of battleships and armoured cruisers from the belt to the ram, was tested under the usual conditions. Three rounds were fired from a 6-pounder quick-firing gun, and each shot, which was fired at a velocity of 1,700 ft. seconds, splashed on the plate, but there was neither crack nor penetration. The plate was then subjected to a more severe test, one round being fired from a 4-in. quick-firing gun at a velocity of 1,650 ft. seconds. Again the shot splashed on the surface, causing neither crack nor penetration, but it set up a slight bulge, which indicated a satisfactory degree of elasticity. The whole of the armour of the battleship *Queen* is being manufactured by Messrs. Cammell and Co.

The order for the laying down of the battleship *King Edward VII.* at Portsmouth during the current financial year has been cancelled, and it is understood that the ship to be laid down at Devonport on the slip from which the *Queen*, battleship, will shortly be launched will be named after His Majesty. A cruiser is to be laid down at Chatham, but no new ship will be begun at Portsmouth during the present financial year. With the work already in hand and the ships to be sent to Portsmouth from Pembroke and the private yards, there will be enough occupation for Portsmouth for quite another year. Meanwhile, the preliminary steps have been taken for erecting a new machinery factory in which all the work of the chief engineer of the Dockyard will be concentrated, but it is estimated that three years will elapse before the factory is in complete working order. The facilities of Portsmouth Dockyard are at the same time being improved by lengthening two docks which hitherto have been capable of accommodating ships up to 400 ft. in length, but which after the alterations will be available for the docking of the new armoured cruisers of 500 ft.

France.—The *France Militaire* states that the French Minister of Marine has decided that extensive alterations and repairs shall be carried out on the three cruisers *Coëtlogon*, *Troude*, and *Forbin*, which belong to the reserve, and are stationed, the first at Lorient and the two others at Rochefort. They were built at Bordeaux more than ten years ago, and have never been good for anything, only one of them, the *Troude*, being fit to put out to sea. The alterations will include the renewing of the boilers, the replacing of the wooden decks, and the modernizing of the artillery. It is expected that the alterations, which will be very expensive, will render the vessels seaworthy and of some value as warships. The battleship *Requin* has undergone extensive alterations at Cherbourg. At her preliminary trial her engines developed 6,230-h.p., against the 6,000-h.p. contracted for, and only 10 of her 12 Niclausse boilers were used. The coal consumption was 1 lb. 9.4 oz. per h.p. The full power trials of the *Requin* have been successfully carried out. The boilers were subjected to a constant pressure of 13½ to 14 kilogrammes. The engines are of 6,250-h.p., and the speed attained was 15.3 knots. The mean consumption of coal was 795 grammes per h.p. per hour. The engines worked very well. The cruiser *Jean Bart*, in reserve at Lorient, is to have her cylinder boilers replaced probably by Niclausse boilers, and an estimate is to be given for replacing her wooden decks by steel ones, as well as the bulkheads of her bunkers, which are in a very bad condition. In 1903 she is to be ready to relieve the *Isly* at Newfoundland, which will then return to undergo similar repairs and alterations.

Holland.—The Dutch Government have decided to adopt Yarrow water-tube boilers in the latest battleship now building, named the *Hertog Hendrik*, of 6,000 h.p.

Italy.—The *Italia Militare e Marina* states that three new Italian battleships of the type of the *Vittorio Emanuele* will be commenced during the current financial year. Battleship "A" will take the place of the *Benedetto Brin* on the stocks at Castellamare; "B" that of the *Regina Margherita* at Spezia; and "C" that of the *Francesco Ferruccio* at Venice. A total amount of only £68,000 has been assigned as a first instalment towards the expense of the three ships; while for the *Vittorio Emanuele* and the *Regina Elena* further instalments of £200,000 each have been assigned. The same paper further states that there are seven vessels building at Pola and Trieste for the Austrian Navy. These consist of three battleships, one cruiser, two river monitors, and a torpedo depot ship. One of the three battleships has been named the *Bamberger*, and is of the same type as the *Habsburg* and *Arpad* (length, 354 ft.; beam, 65 ft. 7 ins.; speed, 18 knots). The two others

are of a new type, with length 390 ft. 5 ins.; beam, 72 ft.; engines, 14,000-h.p.; and speed, 19 knots. Each of the two will be armed with four 9.45-in., eight 7.48-in., six 5.9-in., fourteen 2.75-in., and sixteen machine guns; also two torpedo tubes. This type of battleship will be the largest in the Austrian Navy. The cruiser will be nearly 384 ft. long, and have a speed of 21 knots.

United States.—It has been decided that the United States battleship *Illinois* shall become the flagship of the United States squadron in European waters.

MILITARY.

Lieut.-General Sir H. Le G. Geary has selected Lieut. J. A. Geary, Royal Garrison Artillery, as aide-de-camp on his staff as Governor and Commander-in-Chief of Bermuda.

Colonel Sir T. J. Gallwey has been appointed Principal Medical Officer in India, and left England for Bombay on the 29th ult.

Major-General Wynne, who has been appointed to the command of a first-class district in India, is proceeding to England by the *Briton*. General Settle will succeed General Wynne in the command of the latter's Cape Colony district.

Capt. the Hon. W. P. Hore-Ruthven (Master of Ruthven), D.S.O., is to be appointed regimental adjutant of the Scots Guards, and Capt. F. L. Adam is to be adjutant of the 3rd Battalion of the regiment.

Capt. M. D. Murray, Seaforth Highlanders, has been appointed aide-de-camp to Major-General R. B. Lane, C.B., commanding the Infantry Brigade at Malta, and Captain A. R. Lemprière, Lancashire Fusiliers, acting brigade major.

The troops serving in the British East African Protectorates, including Uganda, British East Africa, and British Central Africa, will in future be known as the King's African Rifles. Brig.-General W. H. Manning is Inspector-General of this force.

The prizes offered by the Secretary of State for War for the self-propelled lorry best adapted for military purposes have been awarded as follows:—The first prize, of £500, to the Thornycroft Steam Wagon Company, Chiswick. The second prize, of £250, to Messrs. Edwin Foden and Company, Sandbach. The third prize, of £100, to the Straker Steam Vehicle Company, London and Bristol. The War Office have purchased the lorries to which the first and second prizes have been awarded for army use, and they will, in all probability, be at once despatched to South Africa.

At the last German army manoeuvres some comprehensive experiments were carried out in the use of mechanical traction. There were in use ten different motor-cars capable of carrying from three to six persons. These were all furnished with benzine motors and were employed in the conveyance of orders and intelligence between the different commanding officers and to the advance guards. According to the *Archiv für Post und Telegraphie* the officers who conducted the experiments considered that several of the vehicles proved themselves quite equal to the military requirements. Besides the motor-cars there were, among others, two Thornycroft steam motor-trucks employed at the manoeuvres, and these gave much satisfaction in the work of supplying the troops from the magazines. The other motor-wagons for carrying loads were also driven by steam, but it was judged from the results that these would require considerable improvement before they could be accepted as suitable for practical military purposes. In the way of road traction engines, two of Fowler's engines (Malta pattern) were employed. They each weighed six tons, including water and fuel, and each dragged three of the ordinary trucks heavily laden. As long as they were on the highroad everything went well, but difficulties arose when they turned out to the soft ground where the men bivouacked. Here the engine had first to go alone, and then, acting as a stationary engine, drag the trucks one by one over the ground by means of a wire rope. The Scott "tractor," already largely in use by the French Government, did not stand the test so well.

METRICAL WEIGHTS AND MEASURES.

TABLES FOR CONVERTING METRICAL WEIGHTS AND MEASURES.

HECTARE.	ACRE.	KILO-MÈTRE.	ENG. MILE.	SQUARE KILO-MÈTRE.	ENG. MILE.
0.405	1	2.471	1.609	1.0621	2.592
0.809	2	4.942	3.219	2.1243	5.184
1.214	3	7.413	4.828	3.1864	7.776
1.619	4	9.885	6.438	4.2486	10.368
2.023	5	12.356	8.047	5.3107	12.960
2.428	6	14.827	9.656	6.3728	15.552
2.833	7	17.298	11.265	7.4350	18.144
3.237	8	19.769	12.875	8.4971	20.736
3.642	9	22.240	14.484	9.5592	23.328
4.047	10	24.711	16.093	10.6214	25.920
8.093	20	49.423	32.186	21.2428	51.840
12.140	30	74.134	48.279	31.8641	77.760
16.187	40	98.846	64.373	42.4855	103.680
20.234	50	123.557	80.466	53.1069	129.600
24.280	60	148.268	96.559	63.7283	155.520
28.327	70	172.980	112.652	74.3497	181.440
32.373	80	197.692	128.745	84.9710	207.360
36.420	90	222.404	144.839	95.5924	233.280
40.467	100	247.114	160.932	106.2138	259.200

MÈTRE.	YARD.	KILO-GRAMME.	LB. AVOIR.	LITRE.	GAL- LONS.
0.914	1	0.454	1	2.20	0.44
1.829	2	0.907	2	4.41	0.98
2.743	3	1.361	3	6.61	1.46
3.658	4	1.814	4	8.82	1.94
4.572	5	2.268	5	11.03	2.42
5.486	6	2.722	6	13.23	2.90
6.401	7	3.175	7	15.43	3.38
7.315	8	3.629	8	17.64	3.86
8.229	9	4.082	9	19.84	4.34
9.144	10	4.536	10	22.05	4.82
18.288	20	9.072	20	44.09	9.64
27.432	30	13.608	30	66.14	14.46
36.576	40	18.144	40	88.18	19.28
45.720	50	22.680	50	110.23	24.10
54.864	60	27.216	60	132.28	28.92
64.007	70	31.752	70	154.32	33.74
73.151	80	36.288	80	176.37	38.56
82.295	90	40.824	90	198.42	43.38
91.438	100	45.360	100	220.46	48.20

For the use of these tables the following explanation is necessary:—The figures in heavier type represent either of the columns beside it, as the case may be; viz., with hectares and acres in the first set of columns, 1 acre=0.405 hectare, and vice versa, 1 hectare=2.471 acres, and so on.

STATISTICAL NOTES.

United Kingdom.—TRADE IN 1901.—The following tables, taken from the Board of Trade returns, show a summary statement of the foreign trade of the United Kingdom for the year 1901, as compared with 1900:—

TWELVE MONTHS ENDED 31ST DECEMBER.

I.—IMPORTS FROM FOREIGN COUNTRIES AND BRITISH POSSESSIONS.

	Twelve months ended 31st December.		+ Increase. — Decrease.
	1901.	1900.	
	£	£	£
I. Animals, living (for food)	9,400,033	9,622,319	—222,286
II. (a) Articles of food and drink, duty free	162,949,666	156,090,088	+6,859,578
(b) Articles of food and drink, dutiable	47,595,501	49,230,529	—1,635,028
Tobacco, dutiable	4,819,473	4,799,417	+20,056
III. Metals	30,787,452	33,195,391	—2,407,939
IV. Chemicals, dyestuffs, and tanning substances	6,129,559	5,560,793	+568,766
V. Oils	11,030,606	11,033,320	—2,714
VI. Raw materials for textile manufactures	79,401,772	77,347,363	+2,054,409
VII. Raw materials for sundry industries and manufactures	57,954,510	65,079,691	—7,125,181
VIII. Manufactured articles	93,609,754	93,225,005	+384,749
IX. (a) Miscellaneous articles	17,298,198	16,771,621	+526,577
(b) Parcel post	1,262,462	1,119,626	+142,836
Total value	522,238,986	523,075,163	—836,177

NOTE.—Sugar and other cognate articles became liable to duties on the 19th April, 1901, and are included in Section II. (b) of the above table.

II.—EXPORTS OF BRITISH AND IRISH PRODUCE AND MANUFACTURE.

	£	£	£
I. Animals, living	742,499	901,843	—159,344
II. Articles of food and drink	14,884,915	13,621,755	+1,263,160
III. Raw materials	33,377,644	41,879,009	—8,501,365
IV. Articles manufactured and partly manufactured, viz.:—			
(a) Yarns and textile fabrics	103,471,561	102,212,400	+1,259,161
(b) Metals and articles manufactured therefrom (except machinery and ships)	39,413,762	45,346,909	—5,933,147
(c) Machinery and millwork	17,855,335	19,619,784	—1,764,449
(d) Ships, new (not registered as British)	9,159,876	8,587,710	+572,166
(e) Apparel and articles of personal use	10,940,060	10,394,200	+545,860
(f) Chemicals and chemical and medicinal preparations	8,942,109	9,262,519	—320,410
(g) All other articles, either manufactured or partly manufactured	38,068,759	36,414,067	+1,654,692
(h) Parcel post	3,642,369	2,951,800	+690,569
Total value	280,498,889	291,191,996	—10,693,107

III.—EXPORTS OF FOREIGN AND COLONIAL PRODUCE.

	£	£	£
Total value	67,846,843	63,181,758	+4,665,085

Fertile Canada.—A correspondent sends us a few sample leaves of tobacco grown in the open air at Prince Albert, on the banks of the Saskatchewan river, in the North-West Territories of Canada. "Many people," the sender says, "are of opinion that this part of our Empire is cold, unproductive, and inhospitable. I trust the accompanying evidence may afford some proof that such is not the case. On November 1 violets were growing in profusion in our gardens here, and to-day, the 13th, we have beautiful sunshine and clear bracing air. Since last April there have been long sunny days, cool nights, generous rains, and, as a result of such providential beneficence, along with a remarkably productive soil and the industry of a comparatively limited population, there are over 60 million bushels of wheat for export from the Canadian West this year. This land truly is destined to be the granary of the Empire. In the North-West Territories alone, consisting of Alberta, Assiniboia, and Saskatchewan, we have 300,000 square miles of land of unsurpassed fertility. A square mile contains 640 acres, so the above area contains about 192 millions of acres—an enormous agricultural section. If a settler's taste is for ranching, he can go to the foothills of the Rocky Mountains in Alberta; if wheat-growing, mixed farming, dairying, cattle-raising, etc., are more to his choice, then Eastern Assiniboia, Northern Alberta, and the great Saskatchewan valley are open to him. In Saskatchewan alone there are over 100,000 square miles of splendid rich soil open for settlement. The new trans-continental railroad—the Canadian Northern—is being pushed through the Saskatchewan valley on towards Alberta, the Rockies, and the Pacific Ocean. This will be a great thoroughfare, with connections affording communication from sea to sea, from Atlantic to the Pacific. Every settler can get 160 acres of land free, and thus becomes a landowner for himself. Prospective emigrants from the old land should look carefully into the prospects and capabilities of the Canadian North-West. Here is a land where every man of energy can make a home and lay up riches. He lives under the old flag, enjoys the liberty of British institutions, and the protection of British laws."—*Times*.

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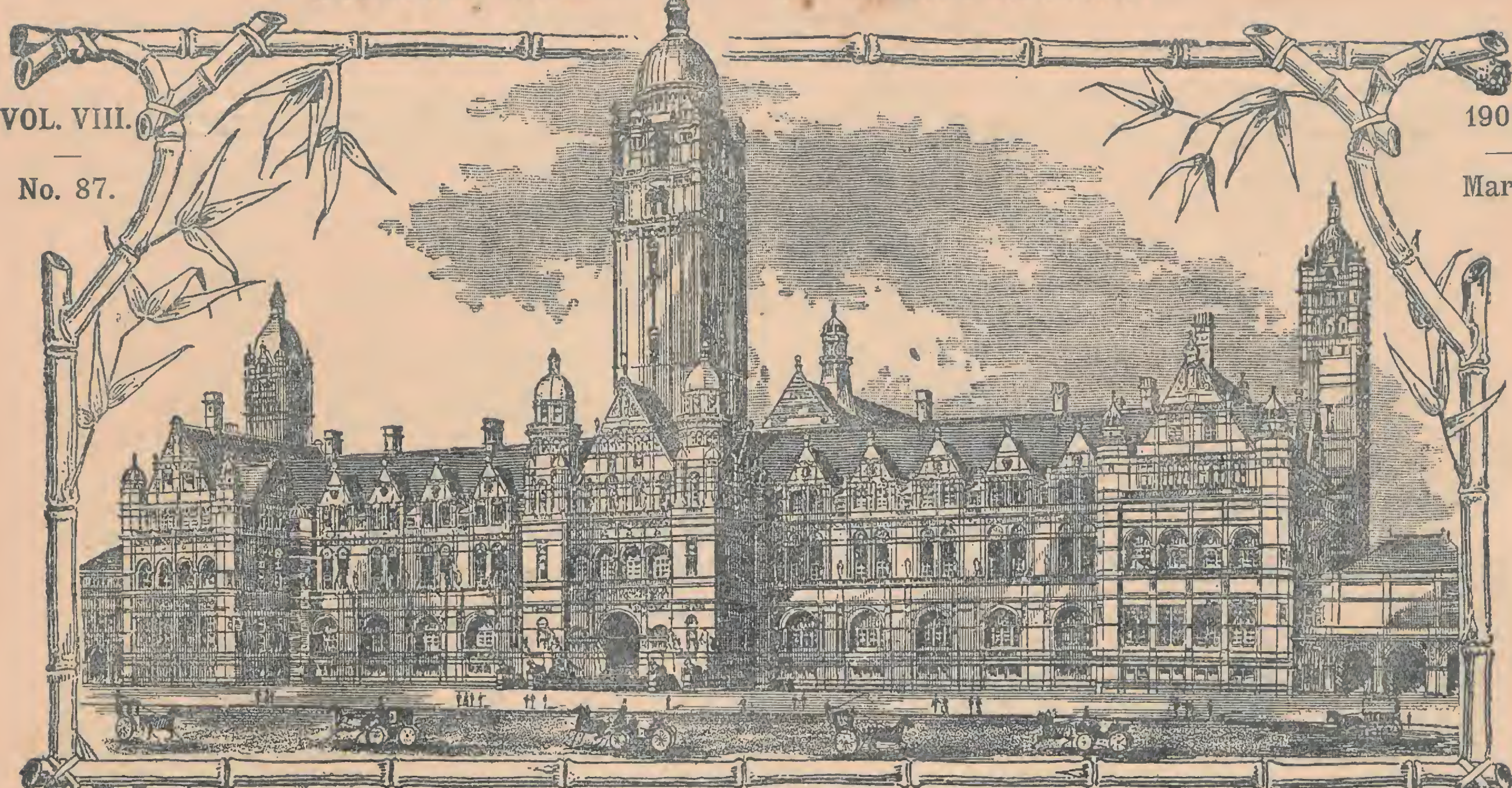
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CAPE COLONY

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HONG KONG & BRITISH NORTH BORN

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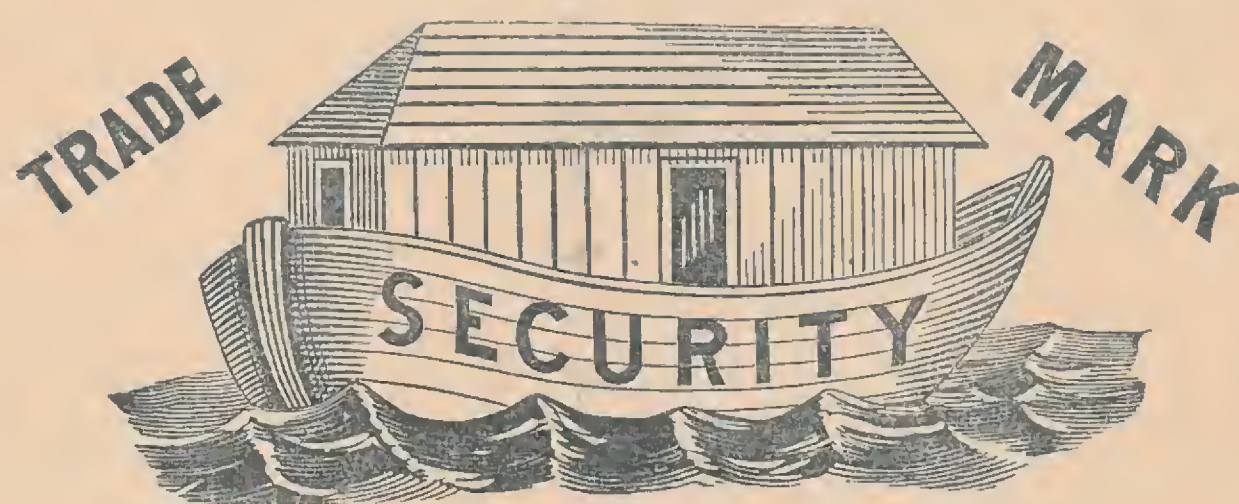
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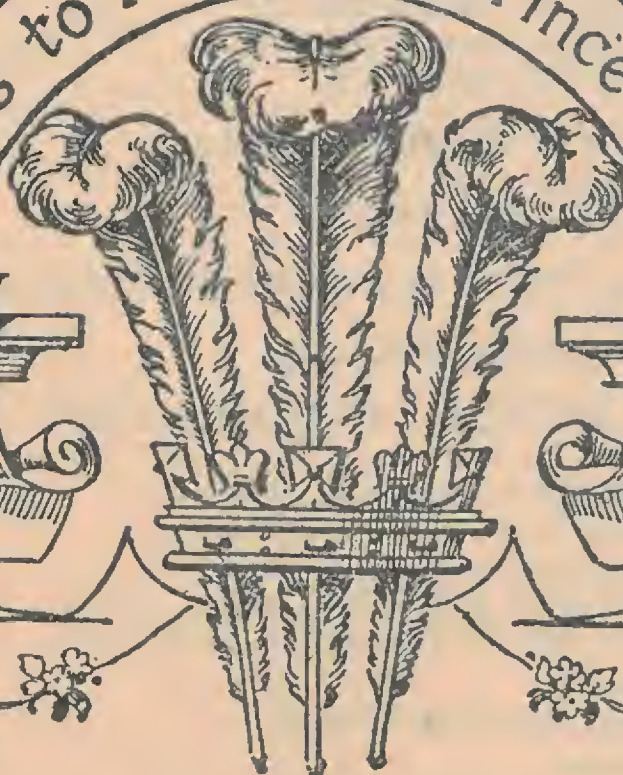
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Products Exhibited.—Canadian furs from Hudson's Bay Co., stuffed birds, wood pulp, slates, vehicles, minerals (asbestos, apatite, mica, plumbago, etc.), agricultural produce, fruits, tobacco, maple sugar, timber, Indian ornamental work, cotton, linen, and leather, and iron manufactures.

THE COMMERCIAL COLLECTIONS OF THE INSTITUTE—continued.

BRITISH AMERICA—continued.

DOMINION OF CANADA—continued.

PROVINCE OF ONTARIO.

Representative Governors.—SIR HENRY TYLER and JOHN PATON, Esq.

Corresponding Agent in Province.—Mr. ARCHIBALD BLUE, Director of Mines, Toronto.

Products Exhibited.—Agricultural produce, preserved fruits, indigenous timbers, gold, silver, iron, lead, and nickel ores, petroleum, marble, granite and decorative stones, coal, native wines, honey, canned meats, and woodwork.

PROVINCE OF BRITISH COLUMBIA.

Representative Governor.—The Hon. J. H. TURNER (Agent-General).

Corresponding Agent in Province.—(At present through Agent-General's Office.)

Products Exhibited.—Agricultural produce, coal, Douglas fir and other timbers, minerals, preserved fruit, tinned salmon, fish oils, woodwork, birds, and animals.

PROVINCE OF NEW BRUNSWICK.

Representative Governor.—C. A. DUFF MILLER, Esq., Agent-General.

Corresponding Agent in the Province.—The PROVINCIAL SECRETARY.

Products Exhibited.—Timbers, minerals, building stones.

PROVINCE OF MANITOBA.

Representative Governor.—The Rt. Hon. the LORD STRATHCONA and MOUNT-ROYAL, G.C.M.G.

Corresponding Agent in Province.—The PROVINCIAL SECRETARY.

Products Exhibited.—Agricultural produce (including barley, beans, corn, oats, peas, rye, wheat, flour, &c.); birds, comprising ducks, grouse, partridges, snipe, etc.; heads of wapiti, caribou, moose and other large game; specimens of native workmanship, photographs, head-dresses, clubs, arrows, beadwork, etc., etc.

PROVINCE OF NOVA SCOTIA.

Representative Governor.—JOHN HOWARD, Esq., Agent-General.

Corresponding Agent in Province.—(At present through Agent-General's Office.)

Products Exhibited.—Minerals, samples of iron ore and products manufactured from the ore, wood-wool.

NORTH-WEST TERRITORIES.

Representative Governor.—THOMAS SKINNER, Esq.

Corresponding Agent in Province.—(At present through the Representative Governor.)

Products Exhibited.—Grain.

NEWFOUNDLAND.

(Upper West Central Gallery.)

Representative Governor.—[VACANT.]

Corresponding Agent.—

Products Exhibited.—Minerals (including ores of iron, copper, manganese, chromium, lead, antimony and zinc, molybdenite, mispickel, mica, asbestos, steatite, granite, marble, slate, coal, and petroleum) and timber.

BERMUDA.

(Middle of Central Lower Gallery.)

Representative Governor.—Gen. SIR ROBERT BIDDULPH, G.C.B., G.C.M.G.

Corresponding Agent.—THE COLONIAL SECRETARY.

Products Exhibited.—Arrowroot, woods, silk, shell-work, and sandstone.

WEST INDIES.

(West Central Lower Gallery.)

BRITISH GUIANA, TRINIDAD, AND TOBAGO.

Representative Governor.—The Rt. Hon. the LORD STANMORE, G.C.M.G.

Corresponding Agent.—Trinidad and Tobago: THE COLONIAL SECRETARY.

Curator of Collection.—(In charge of Institute Staff.)

Products Exhibited.—Arrowroot, cereals and pulses, medicinal barks, cocoa, coral, coffee, indigenous timbers, lace, fibres, rum, spices, starches, sugars, timber, leather, skins, drugs, fish glue, basket-work, condiments, etc.

JAMAICA AND BAHAMAS, WINDWARD ISLANDS, AND BARBADOS.

Representative Governor.—Gen. SIR HENRY W. NORMAN, G.C.B., G.C.M.G., C.I.E.

Corresponding Agent.—Jamaica: THE INSTITUTE OF JAMAICA.

Hon. Curator.—[VACANT.]

Products Exhibited.—Arrowroot, barks, cocoa, coral, coffee, indigenous timbers, lace-bark, fibres, rum, spices, starches, sugars, sarsaparilla, wax, oils, condiments, turtle, etc.

BRITISH HONDURAS.

Representative Governor.—J. McMURRICH CURRIE, Esq.

Corresponding Agent.—[VACANT.] *Hon. Curator of Collection.*—J. M. CURRIE, Esq.

Products Exhibited.—Banana and cassava meal, cocoanut oil, coffee, horns (deer), indiarubber, Indian corn, medicinal barks, pickles, preserved fruits, rice, rope and cordage of native manufacture, rum, seeds edible and ornamental, spices, sponges, sugar, mahogany and other timbers, tobacco, etc.

LEEWARD ISLANDS.

Representative Governor.—[VACANT.]

Corresponding Agents.—Grenada: THE COLONIAL SECRETARY.

St. Vincent: THE ADMINISTRATOR. *St. Lucia:* Mr. T. H. DIX.

Products Exhibited.—Arrowroot, barks, cocoa, coral, coffee, indigenous timbers, fibres, rum, spices, starches, sugars, etc., etc.

FALKLAND ISLANDS. (Middle of Central Lower Gallery.)

Representative Governor.—Gen. SIR ROBERT BIDDULPH, G.C.B., G.C.M.G.

Corresponding Agent.—THE COLONIAL SECRETARY.

Products Exhibited.—Wool, birds' skins and eggs.

BRITISH AUSTRALASIA.

NEW SOUTH WALES.

(East Central Upper and Lower Galleries.)

Representative Governor.—The Hon. HENRY COPELAND (Agent-General), and SIR DANIEL COOPER, Bart., G.C.M.G.

Corresponding Agent in Colony.—(At present through Agent-General's Office.)

Products Exhibited.—Minerals (including gold, silver, coal, &c.), wool, indigenous timbers, wines, cereals, seeds, gums, resins, oils, fibres, rope, leather, tallow, etc., etc.

VICTORIA.

(East Central Upper and Lower Galleries.)

Representative Governors.—Lieut.-General the Hon. SIR ANDREW CLARKE, G.C.M.G., C.B., C.I.E. (Agent-General), and HOWARD SPENSLEY, Esq.

Corresponding Agents in Colony.—(At present through Agent-General's Office.)

Officer in Charge of Collection.—Mr. A. G. BERRY (of the Agent-General's Office.)

Products Exhibited.—Animals, birds, coal, cereals, chemical manufactures, cigars, essential oils, gums, grain, hops, indigenous timbers, leather, leatherware, minerals (including auriferous quartz, coal, kaolin, etc.), models of gold nuggets, seeds, sugar, tobacco, wines, wool, etc., etc.

SOUTH AUSTRALIA.

(East Central Lower Gallery.)

Representative Governors.—H. A. GRAINGER, Esq. (Agent-General), and HENRY BULL TEMPLAR STRANGWAYS, Esq.

Corresponding Agent in Colony.—(At present through Agent-General's Office.)

Officer in charge of Collection.—Mr. EDMUND SNELL (of the Agent-General's Office.)

Products Exhibited.—Agricultural produce, wines, indigenous timbers, furniture, wool, etc.

QUEENSLAND (AND BRITISH NEW GUINEA).

(East Central Lower Gallery.)

Representative Governors.—The Hon. SIR HORACE TOZER, K.C.M.G. (Agent-General), and Gen. SIR HENRY W. NORMAN, G.C.B., G.C.M.G., C.I.E.

Corresponding Agent in Colony.—(At present through Agent-General's Office.)

Curator of Collection.—(In charge of Institute Staff.)

Products Exhibited.—Building stones, eucalyptus oils, fibres, minerals, pearl shells, indigenous woods, cereals, models of fruits, sugar, wine, tinned meats, hides, skins, leather, etc., etc.

WESTERN AUSTRALIA. (East Central Lower Gallery.)

Representative Governor.—The Hon. H. B. LEFROY (Agent-General).

Corresponding Agent in Colony.—(At present through Agent-General's Office.)

Curator of Collection.—(In charge of Institute Staff.)

Products Exhibited.—Wools, gums and resins, olive oil, fibrous barks, silk, skins, indigenous woods, minerals, model gold ingots, etc., etc.

TASMANIA. (East Central Lower Gallery.)

Representative Governor.—The Hon. ALFRED DOBSON (Agent-General).

Corresponding Agent in Colony.—Mr. T. C. JUST, Chief Secretary's Office, Hobart.

Curator of Collection.—(In charge of Institute Staff.)

Products Exhibited.—Cereals, minerals, models of fruits, stuffed fish, furs, timbers, illustrations of local manufactures, etc., etc.

NEW ZEALAND. (East Central Lower Gallery.)

Representative Governors.—The Hon. W. P. REEVES (Agent-General), and THOMAS MACKENZIE, Esq.

Corresponding Agent in Colony.—(At present through Agent-General's Office.)

Curator of Collection.—(In temporary charge of Institute Staff.)

Products Exhibited.—Agricultural produce, building stones, coal, Kauri gum, hemp and flax, tinned meats, wools, tobacco, Kauri and other woods, with illustrations of their application to structural and ornamental purposes; photographs, etc., etc.

FIJI. (Middle of Central Lower Gallery.)

Representative Governor.—Gen. SIR ROBERT BIDDULPH, G.C.B., G.C.M.G.

Corresponding Agent in Colony.—Hon. JOHN HILL, Suva.

Curator of Collection.—(In charge of Institute Staff.)

Products Exhibited.—Barks, fibres, copra, tea, cocoa, coffee, timbers, etc.

BRITISH INDIA (AND ASIA).

INDIA. (East Gallery and Pavilion.)

Representative Governors.—Vide p. 60.

Special Sub-Committee, in charge of the Indian Section (appointed by the Secretary of State for India in Council):—Chairman: Major-General SIR OWEN TUDOR BURNE, G.C.I.E., K.C.S.I.

Members: SIR GEORGE C. M. BIRDWOOD, K.C.I.E., C.S.I.; G. W. VIDAL, Esq., I.C.S.; SIR E. C. BUCK, K.C.S.I.; W. COLDSTREAM, Esq., I.C.S., B.A.; C. H. MOORE, Esq.; T. W. HOLDERNESS, Esq., C.S.I.; SIR CHARLES J. LYALL, K.C.S.I., C.I.E.; Major-General JAMES WATERHOUSE.

Secretary: Mr. J. R. ROYLE, C.I.E.

Channel of Correspondence.—THE REVENUE AND AGRICULTURAL DEPARTMENT, INDIA.

Curator of Collection.—Mr. J. R. ROYLE, C.I.E.

Products Exhibited.—Fodder grasses, foods and food stuffs, sugar, spices and condiments, models of fruits, narcotics (including opium, ganja, etc.), tobacco and cigars, tea and coffee, oils and oil-seeds (including those of castor, sesamum, linseed, cocoa-nut and ground nut, etc.), a large assortment of drugs, dyes and tans, gums and resins (including the resins and turpentine of Indian pines, wax, lac, etc.), an extensive collection of fibres (including cotton, silk, jute, coir, rhea, agave, etc.), models illustrating the manufacture of cotton and jute, minerals (including building stones, coal, mica, soapstone, corundum, iron ores, steel, etc.), timbers, collection of Indian pottery, carved woodwork, silver, brass and copper ware, silk and cotton fabrics.

CEYLON. (East Gallery.)

Representative Governor.—The Rt. Hon. the LORD STANMORE, G.C.M.G.

Executive Officer and Home Agent.—FREDK. H. M. CORBET, Esq., Barrister-at-Law.

Curator of Collection.—Mr. J. R. ROYLE, C.I.E.

Products Exhibited.—Cereals, pulses, edible fruits, roots and grains, spices and condiments, drugs, horns, skins, pearls, shells, wax, oils, gums, resins, dyes, tans, fibres, timbers, building stones, plumbago, metallic ores, rough gems, palm products, tea, coffee, cocoa, cinchona bark, sugar, tobacco, cotton-cloth, mats, rattan and basket work, wood and ivory carving, metal-work, pottery, tortoise-shell and porcupine quill work, lacquer work, lace, etc., etc.

STRAITS SETTLEMENTS (AND JOHOR).

(East Gallery.)

Representative Governor.—SIR CECIL CLEMENTI SMITH, G.C.M.G.

Corresponding Agents.—The COLONIAL SECRETARY (at Singapore); The Dato JAMES MELDRUM (for Johor). *Curator of Collections.*—(In charge of Institute Staff.)

Products Exhibited.—Barks, canes, drugs, fibres, preserved fruits (including Singapore pine-apples), mats, silk fabrics, oils and oil-seeds, dyes and tans, gums, gutta-percha, tin ores and other minerals, teas, coffee, spices, timbers, etc., etc.

MAURITIUS (AND SEYCHELLES).

(West Central Lower Gallery.)

Representative Governor.—[VACANT.]

Corresponding Agent in Colony.—Mr. A. DARUTY DE GRANDPRÉ, Museum Superintendent.

Corresponding Agent for Seychelles.—The Hon. E. B. SWEET-ESCOTT, C.M.G., Administrator.

Curator of Collection.—(In charge of Institute Staff.)

Products Exhibited.—Fibres, hemp, oils, rum, seeds, sugars, tortoise-shell, vanilla beans, with specimens of native workmanship, etc., etc.

HONG KONG. (Middle of Central Lower Gallery.)

Representative Governor.—SIR WILLIAM ROBINSON, G.C.M.G.

Corresponding Agent in Colony.—The HARBOUR MASTER.

Curator of Collection.—(In charge of Institute Staff.)

Products Exhibited.—China, carved and inlaid ivory and wood-work, silver and lacquer ware, silk and cotton fabrics, drugs, paints, dyes, food stuffs, etc., etc.

BRITISH NORTH BORNEO. (West Central Lower Gallery.)

Corresponding Agent.—(At present through the British North Borneo Co.)

Curator of Collections.—(In charge of Institute Staff.)

Products Exhibited.—Timbers, rattans, coal, rice, sago, sugarcane and raw sugar, coffee, cocoa pods, pepper, tobacco, beeswax, camphor, gutta-percha, kapok fibre, dammars, cutch and gambier, hemp, honey, etc.

BRITISH POSSESSIONS (EUROPE).

MALTA, GIBRALTAR, AND CYPRUS.

(West Central Gallery.)

Representative Governor.—Gen. SIR ROBERT BIDDULPH, G.C.B., G.C.M.G.

Corresponding Agent.—(At present through the Representative Governor.)

Curator of Collections.—(In charge of Institute Staff.)

Products Exhibited.—From Malta—Carved stone-work, lace, macaroni, honey, various fabrics, models, pictures, etc., etc. *Gibraltar and Cyprus*—None at present.

IMPERIAL INSTITUTE JOURNAL.

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LONDON.

MARCH, 1902.

GENERAL NOTICES.

"THE IMPERIAL INSTITUTE JOURNAL."

Fellows resident in the United Kingdom, the Colonies, India, and Foreign Countries, are supplied with the JOURNAL free by post each month.

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The JOURNAL may also be purchased for **Sixpence** each copy at the Ticket Office of the Institute and at the railway book-stalls of Messrs. WILLING & Co.

The City Agents for the JOURNAL are Messrs. WILLING & Co., 17, Royal Exchange, London, E.C. It may also be obtained at the offices of the printers, WATERLOW & SONS LIMITED, Blomfield-house, London-wall, London, E.C.

Communications respecting Advertisements should be addressed to the ADVERTISEMENT MANAGER, 6, Arundel-street, Strand, London, W.C.

 This JOURNAL is distributed (by post) throughout the United Kingdom, India, and the Colonies of the British Empire, and to the following Foreign Countries:—*Argentina Republic, Austria-Hungary, Belgium, Bolivia, Chili, China, Colombia, Costa Rica, Denmark, Egypt, France, Germany, Greece, Hawaiian Islands, Holland, Italy, Japan, Mexico, Montenegro, Morocco, Norway, Persia, Peru, Portugal, Russia, Siam, Spain, Sweden, Switzerland, Tripoli, Turkey, United States of America, Uruguay, and Venezuela.* The JOURNAL is also placed in the Reading Rooms of CHAMBERS OF COMMERCE, CLUBS, and HOTELS, both at home and abroad.

LECTURE AND CONCERT ARRANGEMENTS.

LECTURES.

The following **Illustrated Public Lectures** have been arranged for March:—

Mon., 3rd March, at 8.30 p.m. "New Zealand, her Record and her Destiny," by EDWARD WAKEFIELD, Esq. *In the Chair:* The Right Hon. Sir JAMES FERGUSON, Bart., M.P., G.C.S.I., K.C.M.G., C.I.E., formerly Governor of New Zealand.

Mon., 10th March, at 8.30 p.m. "The Poverty of India," by J. D. REES, Esq., C.I.E.

Mon., 17th March, at 8.30 p.m. "Home Life in Canada," by HAMAR GREENWOOD, Esq. *In the Chair:* Lt.-Col. N. WILLOUGHBY WALLACE, Commanding the King's Colonials, Imperial Yeomanry.

Mon., 24th March, at 8.30 p.m. "Nova Scotia," by JOHN HOWARD, Esq., Agent-General for Nova Scotia.

Admission to the Lecture-Hall by the first entrance to the Imperial Institute coming from Exhibition Road.

Seats are reserved for Fellows, who have also the privilege of admitting two Friends for each Lecture, or Address, by reserved seat tickets.

A special series of **Afternoon Lectures and Demonstrations** will be given by R. HEDGER-WALLACE, Esq., formerly of the Departments of Agriculture and Education, Victoria, Australia, on Tuesdays and Thursdays, commencing on Tuesday, March 4th, at 4.30 p.m., on "The Commercial Products and Agricultural Resources of the Crown Colonies." Professor WYNDHAM R. DUNSTAN, F.R.S., Director of the Scientific and Technical Department of the Imperial Institute, will take the Chair at the Opening Lecture. The subject will be divided as follows:—

Tues., 4th March, at 4.30 p.m. INTRODUCTORY. "The North Atlantic Group."

Thurs., 6th March, at 4.30 p.m. "The North Atlantic, South Atlantic and Mediterranean Groups."

Tues., 11th March, at 4.30 p.m. "The Indian Ocean Group."

Thurs., 13th March, at 4.30 p.m. "The Indian Ocean and Bay of Bengal Groups."

Tues., 18th March, at 4.30 p.m. "The China Sea and Australian Groups."

Thurs., 20th March, at 4.30 p.m. "The Pacific Ocean Group."

Admission to these Lectures and Demonstrations, which will be open free to the Public, will be by the Fellows' (Queen's Gate) Entrance to the Institute.

The Demonstrations will be given in the Galleries of the Institute containing the exhibits of the Colonies under consideration, at 3.30 p.m. to 4.15 p.m., on the day of the succeeding lecture.

CONCERTS.

The EVENING CONCERTS for Fellows and their friends will be continued during the Winter Season, 1901-2, and will take place in the JEHANGIER HALL on certain Wednesday evenings, the dates of which will be announced in due course.

The following **Concerts** will take place this month:—

Wed., 5th March, 8.30 p.m. CONCERT by the IMPERIAL INSTITUTE (AMATEUR) ORCHESTRA. *Chairman of Orchestral Committee*, FRANK H. BUTLER, Esq. *Hon. Leader*, LOUIS H. D'EGVILLE, Esq. *Hon. Conductor*, A. RANDEGGER, Esq.

The programme will include the following:—

SYMPHONY IN D MAJOR, No. 31	Mozart.
THREE DANCES (From Grétry's Ballet "Céphale et Procris")	Arr. by Felix Mottl.
(a) BERCEUSE	From Suite
(b) BACCHANALIAN DANCE	"The Tempter"
OVERTURE	"La Dame Blanche"
BARCAROLA ROMANTICA (For Violin and Orchestra)	A. Randegger, Junr.
Solo Violin	Mr. Louis H. D'EGVILLE.
CORONATION MARCH.	Edward German.

Vocalist . MISS GERTRUDE LONSDALE.

Wed., 26th March, 8.30 p.m. CONCERT by the IMPERIAL INSTITUTE (AMATEUR) ORCHESTRA.

Fellows have *free* admission to the Concerts, and can purchase tickets at 2s. 6d. each) for the admission of their Friends.

FELLOWS' DEPARTMENT.

The Reading, Writing, and News Rooms, are open for the use of Fellows every week-day from 10 a.m. till 11.30 p.m., and on Sundays from 3 p.m. to 10.30 p.m. The Library (on the First Floor), is open from 10 a.m. to dusk on Week-days, and from 3 p.m. to dusk on Sundays. The Map Room (First Floor) is open from 10 a.m. to 5 p.m. on Week-days.

The Poste Restante is open every week-day for receipt and delivery of letters and parcels. Letters addressed to initials only are not received, except in reply to notices in the JOURNAL, under "Requirements" Registry. The General Post Office Pillar Box is cleared daily twelve times, between 10.10 a.m. and midnight. Light refreshments only are, for the present, provided in the Fellows' Rooms and at the bar of the Ceylon Kiosk.

SCIENTIFIC AND TECHNICAL DEPARTMENT.

The Scientific and Technical Department of the Institute has been established to acquire information by special enquiries and by experimental research, technical trials and commercial valuation regarding new or little known natural or manufactured products of the various Colonies and Dependencies of the British Empire and of foreign countries, and also regarding known products procurable from new sources, and local products of manufacture which it is desired to export. This work is carried out with a view to the creation of new openings in trade, or the promotion of industrial developments.

In the extensive and well-equipped series of Research Laboratories occupying the West Corridor of the Second Floor, a staff of skilled Chemists, under the direction of Professor Wyndham R. Dunstan, M.A., F.R.S., carry out the investigation of the chemical constitution and properties of new dye-stuffs, tanning materials, seeds and food-stuffs, oils, gums and resins, fibres, timbers, medicinal plants and products; animal products, minerals and ores, soils, cements, and various other products, with a view to their commercial utilization. Whenever necessary these materials are submitted to special scientific experts, by whom they are made the subjects of particular investigation or practical tests. Reports are also obtained from technical or trade-experts in regard to the probable commercial or industrial value of any such products, whilst full information is collected from official or other trustworthy sources regarding the probable extent and cost of available supplies. All materials requiring scientific or technical examination, or commercial valuation, should be submitted to the Institute for examination either by, or through, the Foreign Office, the Colonial Office, the India Office, or the Board of Trade, or through the Colonial or Indian Government Authorities. Requests for the examination of such materials may also be submitted by Public Commercial Bodies and Institutions of the respective Colonies and Dependencies, or by the Representatives of H.M. Government in foreign countries.

COMMERCIAL INTELLIGENCE DEPARTMENT.

The Office of this Department, in the West Corridor, First Floor, is open daily from 10 a.m. to 5 p.m. (on Saturdays till 1 p.m.), for the purpose of answering enquiries and supplying information relating to the Commerce (Export and Import) and Industries of India and the Colonies. Applications may be made personally or by letter. Special information may be obtained from the Curators in charge of the Indian and of certain Colonial Collections. Arrangements have been made for the translation for mercantile firms of Trade Circulars, Price-Lists, and Catalogues into any Foreign Language, including the conversion of weights, measures and coinages, etc., at cost price, and application for such may be addressed to this Department.

COMMERCIAL COLLECTIONS.

The Galleries containing the **Colonial and Indian Collections**, and the **Public Commercial and Industrial News Room**, are open for free inspection by the public daily, *except Sundays, and any days specially notified*, from 11 a.m. until 5 p.m. Every information concerning the products, their supply, etc., can be obtained on application to the Curators of the Indian and Ceylon, Canadian, and South African Sections, to the general Curator, and to the Commercial Intelligence Department.

CITY BRANCH OF THE IMPERIAL INSTITUTE.

The City Branch of the IMPERIAL INSTITUTE, at 112, Cannon-street, E.C., is open to Visitors on week-days from 10 a.m. till 5 p.m. The Branch includes a News Room, supplied with many British and Foreign Commercial Publications, Market Reports, etc., and an Enquiry Office in telephonic communication with the Commercial Information Office of the Imperial Institute. The News Room and Enquiry Office are *free* to Fellows of the Institute; other persons are admitted on payment of £1 annually.

Subscribers are entitled to inspect, *free of charge*, any maps or charts included in the Map Room collection at the Imperial Institute, South Kensington, and to consult any works, or official papers, included in the Institute Library.

The Information Department will undertake to obtain analytical or other examinations of samples by competent Experts, upon payment, by persons submitting them, of the usual professional fees, to be previously specified, and agreed to by the applicant. (*For further information see page 76*).

THE NORTHBROOK SOCIETY.

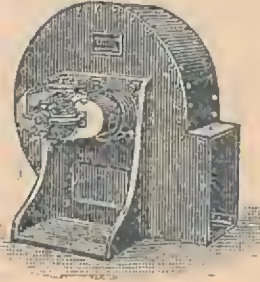
The Northbrook Society is affiliated to the Imperial Institute, and has a special room allotted for the exclusive use of its members in the Institute buildings. Its primary objects are to watch over and promote the interests of natives of India, and to provide a system of guardianship or supervision over such as are sent to Europe for education. The Society is controlled by a committee consisting of an equal number of Governors of the Imperial Institute and members of the Society, presided over by the Earl of Northbrook. It possesses an excellent library. Indian members, who pay no subscription to the Society, have the especial advantage of becoming Fellows of the Institute at half the usual subscription payable by the ordinary Fellows. Applications for membership of the Society should be addressed to the Secretary of the Northbrook Society, Imperial Institute, London, S.W.

FANS

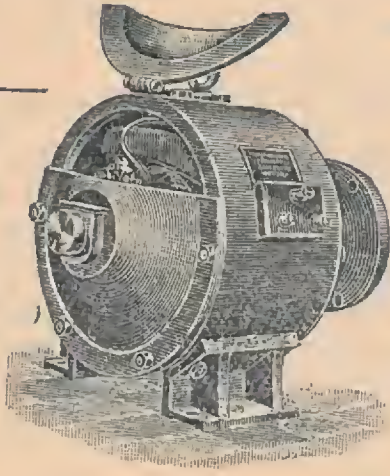
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NOTICE.—For the early information and convenience of Shipowners, Captains, and others, ALL NEW ADMIRALTY CHARTS that may be published from time to time are noted every Monday in the *Shipping Gazette* and *Lloyd's List* on page 7; in the *Shipping Gazette* and *Lloyd's List Weekly Summary* every Friday, on page 1; and in the *Lloyd's Weekly Shipping Index* every Friday, on page 3 of Cover. The new and corrected Admiralty Charts are also noted in the following weekly and monthly journals:—*The Syren*, *The Nautical Magazine*, *The Geographical Journal*, *The Shipping World*, *The Mariner*, *THE IMPERIAL INSTITUTE JOURNAL*, and *The Steamship*, etc., etc.
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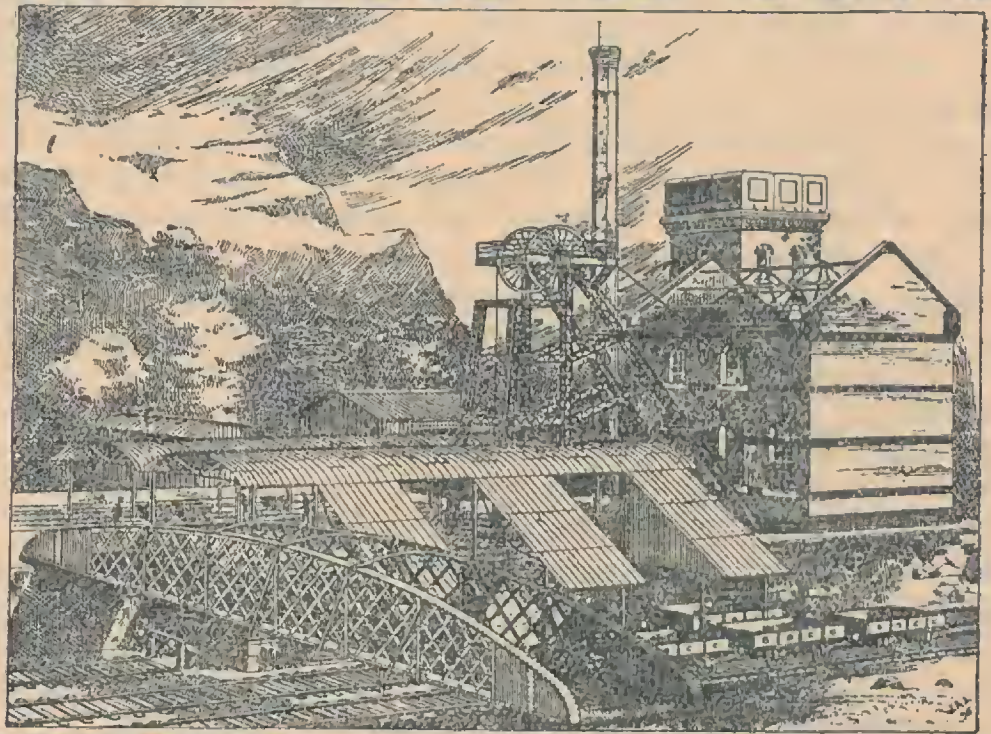
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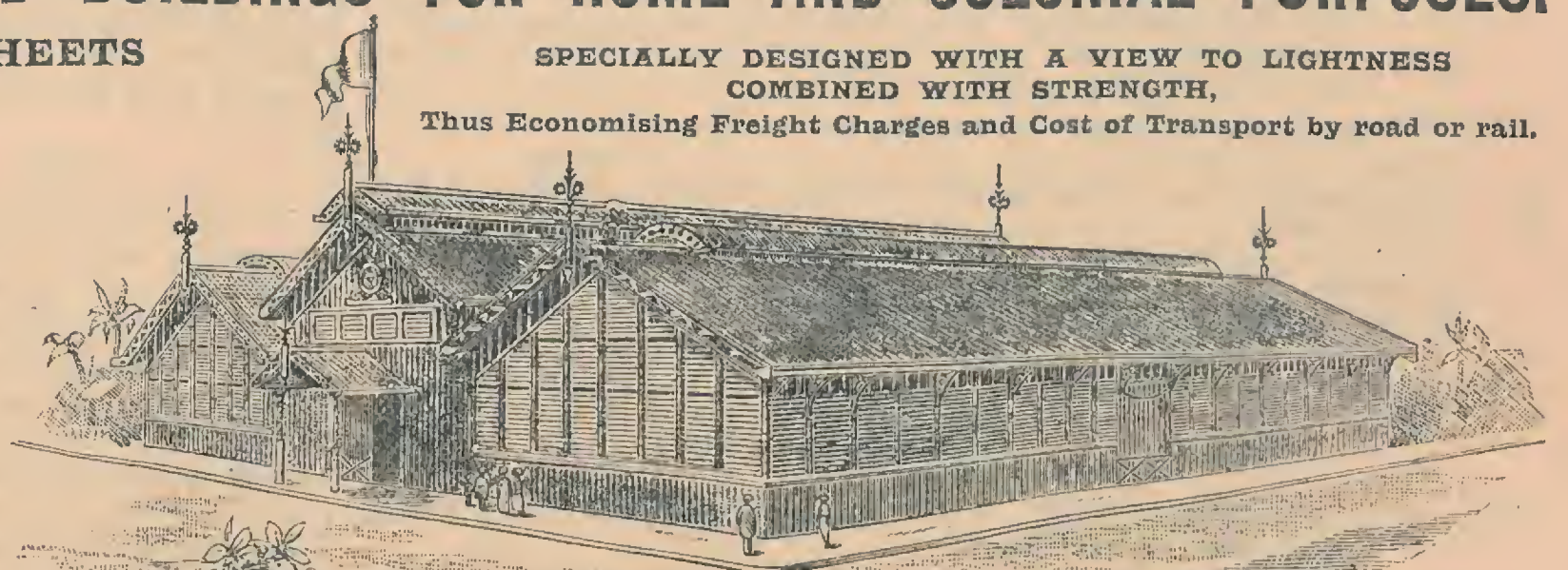
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FINANCIAL AND COMMERCIAL RETROSPECT.

UNITED KINGDOM.—The Board of Trade returns for January compared fairly well with those for the same month of last year. The imports were worth £50,131,348, thus showing an increase of £4,143,832, or 9.0 per cent. The classes of articles in which improvement was most noticeable were articles of food and drink, and raw materials for textile manufactures. Live cattle fell off in numbers by 11.6 per cent., and the reduction of value was almost precisely proportionate, but sheep and lambs improved by 79.3 per cent. in quantity and 82.7 in value. In bacon and beef there was little alteration. The value of the butter imported reached the huge value of £1,897,554, representing an increase of 10.9 per cent. in quantity and 8.2 per cent. in value. Eggs, worth £477,227, improved 14.1 per cent. in number, and over £70,000 in value. In cereals, wheat, with an increase of 10.5 per cent. in amount, was better in value by 9.4 per cent., but wheat flour was less by 1.7 per cent. in the latter respect, though its amount was slightly greater. Barley again for an increased amount of 12.5 per cent. only improved in value to the extent of 1.6 per cent., while with oats this condition was reversed, for an increased importation of only 3.1 per cent. was accompanied by an increase in value of 23.7 per cent. Indian corn increased by 812,403 cwt. (13.6 per cent.), and its value rose by £504,402 (37.1 per cent.), Russia, Argentina and Roumania sending larger quantities, though the shipments from the United States showed a diminution of nearly five million cwt. In refined sugar, possibly in anticipation of an increased duty, there was a rise of 1,933,405 cwt., the value being enhanced by £903,857, and raw sugar increased by 750,360 cwt. in quantity and £164,439 in value. In tea there was a slight decline of 2 per cent. both in quantity and value, but coffee improved 103.4 per cent. in the former respect and 68.4 in the latter. With regard to raw materials for textile manufactures, there was an increase in the imports of cotton from Egypt and the United States, though less was sent by the British East Indies; the result was a net increase of 751,863 cwt. (36.9 per cent.) in quantity and of £1,168,385 (20.4 per cent.) in value. Sheep's wool also largely increased, owing to extensive shipments from Russia, Turkey, France, British South Africa and Australasia, and hemp was better by 60.4 per cent. in quantity and 118.6 per cent. in value. Jute was greater in amount though less in value, while flax fell off over 30 per cent. in both respects. The exports of British and Irish produce, valued at £24,254,574, showed a decrease of £498,957 or 2.0 per cent. The loss in the value of coal is more than sufficient to account for the reduction, for though the amount exported was only 32,461 tons less than in January of last year, the diminution in value was £521,046. Iron and steel increased by 18,237 tons (8.8 per cent.), but the value was £82,602 less. Machinery also declined by £39,117 (2.6 per cent.), although more locomotives were sent to India, Australia and British South Africa. New ships increased by £134,573. In cotton yarn and twist there was an increase of 1,062,900 lb. in quantity, but the value was less by £65,546 (9 per cent.). The same was true of cotton piece-goods, though the fall in value was less—only 0.3 per cent. or £19,263; the quantity, however, increased by 5.2 per cent., or over 25 million yards, owing to a heavier demand from Egypt, Japan, Brazil, Uruguay, Argentina, British South Africa and China; the last country alone accounted for an increase of 35 million yards, but, on the other hand, smaller shipments were sent to India, British West Africa, Chili and the United States. Jute yarn rose 55.2 and 48.2 per cent. in quantity and value, but the piece-goods were less by 4.2 and 3.8 per cent. respectively. In linen yarn there was a decrease of 24.9 per cent. in amount and 14.7 per cent. in value, but the piece-goods were better by 8.1 per cent. in the former respect and 7.4 per cent. in the latter. Sheep's wool improved 20.6 per cent. in quantity and to a less extent in value, but woollen and worsted yarn was worth 5.3 per cent. less, though its amount was 7.1 per cent. greater. Woollen tissues slightly improved in both respects, but worsted tissues were slightly worse. In spirits there was the considerable advance of 17.7 per cent. in quantity and 21.8 per cent. in value. Refined sugar was nearly a third less. Soda compounds were worth 12.8 per cent. more, and chemical manures improved by 22.4 per cent. in quantity, though their value did not rise proportionately. The re-exports of foreign and colonial merchandise were worth £5,340,446, an increase of £289,139, or 5.7 per cent. over the figures for the same month of last year.

The results obtained by English railways in the December half of last year were of a somewhat uneven character. Among the big lines, two (the Great Northern and Great Eastern), increased their dividends by $\frac{3}{4}$ per cent., one (the Great Western), by $\frac{1}{2}$ per cent., and one (the Lancashire and Yorkshire), by $\frac{1}{4}$ per cent. The London and North Western, the Midland, and the London, Brighton and South Coast, maintained the same rate, while the London and South Western had to diminish its distribution by $\frac{1}{4}$ per cent., the South Eastern by $\frac{5}{8}$ per cent., and the North Eastern by 1 per cent. The case of the last line is rather peculiar. During the half-year it reduced its train-mileage by 483,000 miles, yet its working expenses increased by £45,983, and this, coupled with a reduction in gross revenue of £60,943, resulted in a decrease of £106,926 in net revenue. In contrast to this unhappy performance, the Great Northern reduced its train-mileage by almost exactly the same amount, but succeeded in saving £38,278 in working expenses and in increasing its gross revenue by £25,055. Similarly, the North Western, with a train mileage smaller by 692,000 miles, spent £32,809 less on working expenses, and at the same time increased its traffic receipts by £39,270. The Great Central, too, was successful in measures of economy, for by saving 107,000 miles in train-mileage and cutting down its working expenses by £60,147, it obtained an increase in its net revenue of £77,047.

The Lancashire and Yorkshire, again, decreased its mileage by 310,000 miles, and improved its net revenue by £36,357. The Great Western's results were the best of all. It ran 154,000 miles more (part of the increase being, doubtless, explained by the fact that it had 28 miles more of line in use), and its working expenses rose by £43,974, but its receipts were so much higher that its net revenue showed an improvement of £114,105. The Midland does not appear to have joined in the fairly wide-spread attempt to diminish train-mileage, for in this respect it reports an increase of 899,000 miles, though it had only 2 more miles of line to work; still its working expenses did not increase inordinately, and a larger gross revenue enabled it to improve its position by £56,610.

For the Irish railways the half-year was not very brilliant. Only one of them, the Belfast and County Down, managed to increase its dividend, by $\frac{1}{2}$ per cent.; two others, the Belfast and Northern Counties and the Great Northern, maintained it at the same rate, but the shareholders of the Great Southern and Western and of the Midland Great Western had to put up with a reduction of 2 and 1 per cent. respectively. As usual, the Dublin, Wicklow and Wexford paid nothing.

The recent issue of £3,000,000 three per cent. London County Consolidated Stock was applied for to the extent of £27,256,860. Of the total applications, 2,991 in number, 96 were for sums between £500,000 and £100,000, while there were six applications for £20, and three for £10. Small applications up to £200 were allotted in full, while applicants for larger amounts were dealt with *pro rata*, though no allotment of less than £200 was made.

COLONIES.—The gold output of the mines working on the Witwatersrand in January was 70,340 oz.; in December the amount was 52,897 oz. The total yield of Victoria in January was 39,091 oz., of New South Wales 46,235 oz., of Queensland 53,100 oz., and of New Zealand 32,860 oz. In West Australia 79,926 oz. were entered for export, and 88,233 oz. were received at the Perth mint for coinage, the total thus being 168,159 oz.

The following table shows the variations which have occurred in certain Colonial Government securities during the past three months:—

	30th Dec.	28th Jan.	25th Feb.
Canada 3 per cent.	101 $\frac{1}{4}$ —101 $\frac{3}{4}$	101 $\frac{1}{4}$ —101 $\frac{3}{4}$	101—101 $\frac{1}{2}$
Cape 3 per cent.	95—95 $\frac{1}{2}$	94—94 $\frac{1}{2}$	96—96 $\frac{1}{2}$
Natal 3 per cent.	94—95	93 $\frac{1}{2}$ —94 $\frac{1}{2}$	93—94
New S. Wales 3 per cent.	95 $\frac{1}{2}$ —96	95 $\frac{1}{4}$ —96 $\frac{1}{4}$	96 $\frac{1}{2}$ —97
New Zealand 3 per cent.	94 $\frac{1}{2}$ —95	94 $\frac{1}{2}$ —95	95—95 $\frac{1}{2}$
Queensland, 3 per cent.	93 $\frac{3}{4}$ —94 $\frac{1}{4}$	93 $\frac{3}{4}$ —94 $\frac{1}{4}$	94 $\frac{3}{4}$ —95 $\frac{1}{4}$
South Australia 3 per cent.	93 $\frac{1}{4}$ —93 $\frac{3}{4}$	93—93 $\frac{1}{2}$	93 $\frac{1}{2}$ —94
Tasmania 3 $\frac{1}{2}$ per cent.	103 $\frac{1}{2}$ —104 $\frac{1}{2}$	103 $\frac{1}{2}$ —104 $\frac{1}{2}$	103 $\frac{1}{2}$ —104 $\frac{1}{2}$
Victoria 3 per cent.	96 $\frac{1}{4}$ —96 $\frac{3}{4}$	96 $\frac{1}{2}$ —97	96 $\frac{1}{2}$ —97
West Australia 3 per cent. (May—Nov.)	92 $\frac{1}{2}$ —93 $\frac{1}{2}$	92 $\frac{1}{2}$ —93 $\frac{1}{2}$	93 $\frac{1}{4}$ —93 $\frac{3}{4}$

INDIA.—A number of the mines working the Kolar goldfield, including the Balaghat, Champion Reef, Mysore, Nundydroog and Ooregum, have come to an agreement with the Mysore Government (subject to the approval of the Government of India) that the leases under which they work shall be renewed from March, 1910, so as to ensure them a tenure of their mining rights for 38 years from the present time. In addition to the present royalty, the mines will be required to pay 2 $\frac{1}{2}$ per cent. on dividends declared after March, 1910.

The following table shows the fluctuations which have occurred in certain Indian railway companies' securities, during the last three months:—

	30th Dec.	29th Jan.	26th Feb.
Bengal and North Western	127—131	130—134	131—135
Bengal-Nagpur Gua. 4 per cent.	106—110	105—109	103—107
Bombay, Baroda & Cent. India	171—176	155—165	157—163
Indian Midland 4 per cent.	106—110	104—108	103—107
Madras Grntd. 5 per cent.	134—138	136—140	133—137
South Indian 4 $\frac{1}{2}$ per cent. Deb.	136—141	137—142	138—143
Southern Mahratta 3 $\frac{1}{2}$ per cent.	107—111	106—109	106—109

FOREIGN COUNTRIES.—The returns of French foreign trade for last year show that the imports reached a value of over 188 $\frac{1}{2}$ millions sterling against rather less than 188 millions in the preceding year, while the exports at 166 $\frac{1}{2}$ millions were more than 2 $\frac{1}{2}$ millions better. Great Britain was far and away France's largest source of supply, sending over 26 $\frac{1}{2}$ millions of the imports. The United States came next on the list with 19 $\frac{1}{4}$ millions, followed by Germany with nearly 16 $\frac{3}{4}$, Belgium with nearly 15 $\frac{1}{2}$, and Argentina with over 14 $\frac{1}{2}$ millions. In the exports the lead of Great Britain was still more marked. She took French produce to the extent of 50 $\frac{1}{2}$ millions, and was thus more than twice as good a customer to France as Belgium, which came next on the list with 23 $\frac{3}{4}$ millions. Germany contributed goods to the value of nearly 18 $\frac{1}{2}$ millions, and the United States followed next, but a long way behind, with 9 $\frac{1}{2}$ millions. Of the total value of the imports received from England, more than a quarter was due to coal, which in 1901 was worth £7,632,000 and in 1900 £8,146,000. The next largest item was wool which, worth £1,633,560 in 1900, jumped to £3,623,560 last year. Machinery came third with a value of £1,322,000 (a decrease from £1,603,000 in 1900) and woollen goods were fourth with £1,088,000. On the other hand, of goods sent to England by France, silks, worth nearly 5 $\frac{1}{2}$ millions, formed the largest item. Then followed woollens with £4,600,000, millinery and artificial flowers with £4,314,000, raw sugar with £3,910,000, wines with £2,256,000, and clothing with £2,031,880. The spirits England bought from France were worth £1,185,000 and the refined sugar £1,092,000. One interesting, though minor, item in the exports is that of automobiles. In 1899 the exports of these from France to all countries were valued at £170,360, in 1900 at £376,680, and in 1901 at £631,280, England being apparently the best customer. The total entries of ships with cargo into French ports fell from 18,360,448 tons in 1900 to 18,199,003 in 1901, the French tonnage rising from 4,678,506 tons to 4,703,209, while the foreign fell from 13,681,942 to 13,405,794. In the clearances, however, there was an increase from 12,804,292 to 13,125,730 tons; both French and foreign tonnage shared, the former increasing from 4,332,585 to 4,503,131 tons, and the latter from 8,561,707 to 8,622,599.

Our usual table of exchanges follows :—

	30th Dec.	29th Jan.	25th Feb.
Paris, cheques	25f. 14c.	25f. 12½c.	25f. 15½c.
Berlin, sight	20m. 39½pf.	20m. 44½pf.	20m. 48pf.
Vienna, sight	23kr. 91½	23kr. 93½	24kr. 00½
Amsterdam, sight . . .	12fl. 10¼	12fl. 13½	12fl. 14½
Madrid, sight	34ps.	33ps. 80	34ps.
Lisbon, sight	39d.	40d.	40½d.
St. Petersburg, 3 months	93r. 65	93r. 90	94r. 05
Bombay, T.T.	rs. 4d.	rs. 4½d.	rs. 4½d.
Calcutta, T.T.	rs. 4d.	rs. 4½d.	rs. 4½d.
Hong Kong, T.T. . . .	rs. 10¼d.	rs. 10d.	rs. 9¾d.
Shanghai, T.T.	2s. 6¼d.	2s. 6½d.	2s. 5¾d.

AGRICULTURAL RETROSPECT.

UNITED KINGDOM.—The most notable feature of the weather during the present winter is the deficiency in the rainfall. Since January 1st the rainfall is behind the average by nearly two-and-a-half inches, and springs and wells and other sources of water supply are accordingly running low. It follows, then, that farmers have the prospect of either a dry spring or, if the arrears of precipitation are to be made up to any extent, of wet soils when tillage work should be actively proceeded with. The short period of frost during the middle of February did not injuriously affect the young crops, but neither was it sufficiently protracted to allow opportunities for carting manure on to the land, which is perhaps the work most in arrear at the present moment. The absence of severity in the weather has been propitious for the lambing flocks, and reports from the pens are for the most part favourable.

A series of experiments on the destruction of charlock amongst corn crops was carried out last season in various parts of Lancashire by Mr. Frank P. Walker, lecturer on agriculture at the Harris Institute, Preston, who has prepared an instructive report on the results. This yellow-flowered, cruciferous plant, often called wild mustard, is known in Scotland as skellocks, in Ireland as preshaugh, and amongst its other local names are ketlock, kedlock, and yellow weed. The direct mischief occasioned by charlock is that, by its rapid growth, it quickly overshadows the young growing corn; in a dry season it seizes the soil moisture which the corn crop needs, and it produces its flowers and seeds by using up the plant food which should have gone to nourish the corn crop. The result is a crop much lighter in grain and shorter in straw than it should have been, and a new crop of charlock seed ready to repeat and extend the mischief in the succeeding season. Indirectly, charlock is mischievous in that it encourages the turnip "fly" or flea beetle, providing it with food until its favourite crops, the turnip and swede, are ready for it; and also that it harbours the slime fungus, which is the cause of the disease known as club-root, or finger-and-toe, in cabbages, turnips, and allied cruciferous crops. A solution of sulphate of copper (blue vitriol) or of sulphate of iron (green vitriol) sprayed upon young charlock plants will effect their destruction. Of these two agents, however, Mr. Walker sums up strongly in favour of sulphate of copper—it is more destructive in its effects upon charlock, and it is a far pleasanter material to have to handle. The machine used for spraying was Strawson's No. 2 Charlock Destroyer, which worked most satisfactorily and produced an exceedingly fine spray. The cost of spraying per acre varies according to the proximity of water supply, the cost of material, and the expenses of labour in each particular district. Under favourable conditions, and using 15 lb. of sulphate of copper at 30s. per cwt. per acre in 50 gallons of water, the cost should be about 3s. 4d. to 3s. 6d. per acre. Whilst spraying with sulphate of copper injures and eventually kills the rough-leaved charlock, it does no harm to the smooth-leaved plants constituting the corn crops which are so liable to become infested with charlock. It is, however, a familiar and an approved practice to sow grass and clover seeds in a corn crop so that, when the latter is harvested, the young crop of grass and clover may already have made some amount of growth. Is spraying against charlock inimical to these grass and clover seeds? This is a question of high practical importance, and the answer, in general terms, is in the negative. Half-a-dozen plots were specially set apart for experiments upon this point, and, though in some cases the clover and grass may receive a check, it appears to be always of a temporary character, the final results being strongly in favour of the practice of spraying.

In the course of his inaugural address to the students at the Colonial College, Hollesley Bay, Suffolk, Professor W. J. Malden, the new principal, dealt with the subject of live stock as it affects the colonies, as well as farming at home. He referred to the need that must arise for the colonies to adapt themselves to the changed conditions occasioned by the low price of wool since the modern glut assumed a chronic form, and since the cold storage of meat has passed into the domain of successful practice. It is highly desirable that intending colonists should understand the laws of breeding, so that in endeavouring to bring about what might be regarded as necessary changes in breed the losses which error would involve might be prevented. Students should learn the characteristics of the various British breeds, in order to be able to judge of the capabilities of such breeds in other lands and beneath other skies. It is a great mistake to go abroad without such knowledge, as it is only in England that it can be efficiently acquired. The large number of students in the college from distant countries shows the value which people in

the colonies and in foreign countries place upon a thorough grounding in the practices of English farming, undoubtedly the most skilled farming in the world.

COLONIES.—Mr. W. Willcocks, C.M.G., one of the leading authorities on irrigation in Egypt, and the original designer of the great Nile reservoir at Assuan now approaching completion, proceeded some months ago to SOUTH AFRICA, at the invitation of Lord Milner, in order to study the question of irrigation in the Cape Colony, the Orange River, and the Transvaal. The report which he addressed to the High Commissioner, under date Johannesburg, November 6, 1901, on completion of his mission, has now been issued. Except in the extreme south-western corner of Cape Colony, agriculture has scarcely been attempted, except on the most primitive lines, and on the most insignificant areas. Farmers to-day trek from the high veld to the low veld and back again, with the seasons, just as the wandering Arabs of the desert have done for centuries. The reason for this want of development of the agricultural wealth of the country, and the consequent acute stage of the poor white question, lies in the fact that the rainfall of the three colonies, with the exception of the extreme south-west corner, is not only erratic and uncertain at the times most opportune for sowing, but is constant and heavy in autumn. Autumn again is quickly followed by a very severe and frosty winter without a particle of moisture in the air. When rain is wanted it is generally not there, when it is not wanted it is invariably present. For countries so situated the only possible means of development lie in the storage of water when it is present and not needed, and its utilization when it is needed. Agriculture without irrigation is generally impossible in the new colonies. If these countries are ever to develop their immense agricultural wealth, the first step must be to proclaim the countries themselves as arid or semi-arid regions, and legislate accordingly. In many countries statesmen have considered that irrigation works should be left to individuals and concessionaire companies. Such works, when of any magnitude, have been, as a rule, conspicuous failures in the hands of companies, which have been impatient to realise profits and which have, in consequence, forced their engineers to overtax their reservoirs and canals in their early and undeveloped stages. With works carried out by States, the results have, on the contrary, been decidedly encouraging. Having served for 12 years in the Indian Irrigation Department, and 18 years in Egypt, Mr. Willcocks naturally considers the execution of important irrigation canals as the first works which an enlightened Government should carry out in an arid or semi-arid country. Not only do well-conceived and well-executed irrigation works bring in a direct benefit to the State if allowed to develop on slow and natural lines, but they also bring in all the indirect benefits which a State reaps from increased wealth of every kind. If this is the case in ordinary countries, much more is it the case in South Africa, where there are special difficulties, which can be solved by irrigation alone. In young countries where the extension and amelioration of the arable land provide outlets for the ever-increasing population, the poor white question never reaches the acute stage it has already reached in South Africa with its pastoral population. The acuteness has been aggravated in the country by the fact that the poor whites of European parentage consider manual labour degrading when carried on in competition with black labour. Fortunately, there is one kind of manual labour which the poor white considers as becoming, and that is agricultural labour. While the country is given up to stock-farming the poor white has but little outlet for his energies in the only direction in which his sentiments allow him to exercise them. If, however, the State were to carry out irrigation projects, employing labour-saving machinery and white labour, and then to take up along the canals such tracts as were suitable for agriculture, it would first find work for the poor whites and eventually settle them on the land with occupancy rights. Such tenants would pay a fixed rent to the landlord and a fixed water-rate to the Government. Mr. Willcocks suggests that part of the profits of the mines might be equitably and usefully invested in irrigation works for the permanent development of the country. He gives a detailed description of the different sections of the three colonies he has visited and the most suitable measures for providing for their irrigation, and also makes valuable suggestions with regard to the raising of revenue for the purposes of irrigation expenditure.

The investigations conducted under the auspices of the Dominion Department of Agriculture in order to ascertain which are the varieties of the different farm crops best suited to the soils and climate of CANADA have now been in progress for seven years, and commendable promptitude has been shown in the issue of the report for 1901, so that it may be in farmers' hands before they begin their seeding operations in the approaching spring. The experiments are carried out not only at the central experimental farm, Ottawa, but at the provincial experimental farms situated respectively at Nappan in Nova Scotia, at Brandon in Manitoba, at Indian Head in the North-West Territories, and at Agassiz in British Columbia, these constituting with the central institution a chain of experimental farms stretching across the country from east to west. The average yields of oats per acre per annum over the last six or seven years have been 61 bushels at Ottawa, 63 at Agassiz, 69 at Nappan, 84 at Brandon, and 90 at Indian Head. The 12 varieties of oats out of upwards of 60 tried which have produced the largest average annual crop at all the stations are—in descending order—Banner, American Beauty, Mennonite, Holstein Prolific, Bavarian, Buckbee's Illinois, Golden Beauty, Columbus, Golden Giant, Early Golden Prolific, Abundance, American Triumph. The average yield per acre ranged from 76 bushels for Banner down to 70 for American Triumph, and the average over all the 12 varieties was 72 bushels per acre. Of two-rowed barley the average yield per acre per annum over six or seven years has been 37 bushels at Agassiz, 41 at Nappan, 43 at Ottawa, 44 at Brandon, and 55 at Indian Head. The six varieties which have given the best average results at all the farms together have been French Chevalier, Beaver, Danish Chevalier, Canadian Thorpe, Nepean, and Newton, the average yield per acre per annum ranging from 46 bushels for the first-named down to 42 bushels for the last. The general average yield of all six has been 43 bushels per acre per annum. Of six-rowed barley the average yield per acre per annum over six or seven years has been 37 bushels at Agassiz, 46 at Nappan, 49 at Ottawa, 51 at Brandon, and 58 at Indian Head. The six varieties which have afforded the best average annual yields at all the farms together have been

Mensury, (51 bushels), Odessa, Trooper, Common, Royal, Oderbruch (45 bushels). The general average yield of all six has been 47 bushels per acre per annum. Out of over 70 varieties of spring wheat tried, the 12 which have yielded the biggest average crops at the individual stations have afforded an annual average of 25 bushels per acre per annum at Ottawa, 28 at Agassiz, 32 at Nappan, 36 at Brandon, and 42 at Indian Head. The 12 varieties which have given the highest average annual yield per acre at all the farms together have been Preston, Wellman's Fife, Monarch, Goose, Huron, Red Fife, White Fife, Hungarian, White Connell, White Russian, Rio Grande, and Pringle's Champlain, the yields ranging from 33 down to 31 bushels. The general average yield of all 12 has been 32 bushels per acre per annum. Similar experiments have been made with maize, peas, turnips, mangels, sugar beets, carrots, and potatoes.

A suggestion has been received by the QUEENSLAND Department of Agriculture for the adoption of the eland as a profitable animal for grazing. The hopelessness of successful cattle-raising in the scrub-covered country between the Overflow and the Bogan river, where neither fire nor water will eradicate the scrub, has suggested the idea of putting upon these lands an animal which will eat the scrub, whose natural food it is, who will fatten on it, will not require much water, and is able to travel for what it wants. The eland, it is claimed, is such an animal. This antelope, when fully grown, is as large as a two-year-old shorthorn, and has more the appearance of a high-bred bullock than an antelope. It can live on the hardest fare, and soon grows fat on good pasture. It is further claimed, as an advantage, that it becomes quite tame, and is easily acclimatized. In Africa the eland feeds on various kinds of acacia and on the "kanna," which appears to be identical with the Queensland saltbush. A long list of plants which are common to South Africa and Australia adds to the force of the contention that the conditions of the island continent would suit the eland equally well with those of its African home. The hope is expressed that wealthy and enterprising people interested in the Australian meat supply may see their way to commence introducing the eland.

INDIA.—Prompted by the idea of the possibility of some addition to the duty on tea imported into the United Kingdom, a deputation representing the interests of the growers of tea in India and Ceylon waited on the Chancellor of the Exchequer on the 4th ult. in order to assure him that any such addition, if made, would have an injurious effect on that industry. The *Times* expresses no sympathy with the tea-growers in this matter. Every tax that can be proposed, it states in a leading article on the subject, is invariably met by a loud outcry from some trade which pretends that its very existence will become problematical if that particular tax is imposed. The tea deputation conformed very accurately to the common rule—their industry is of so peculiar a kind that an increase of duty is not handed on to the consumer according to the well-known economic law, but is paid by the producer, with possibly the exception of a small fraction, expressed in quality rather than in price. Yet, though the consumer does not pay the duty, he is presumed to be so sensitive to its imposition that he at once reduces his consumption of tea, so that the poor producer not only pays the duty for him, but loses his custom into the bargain. When twopence was taken off the tea duty in 1890 the consumption increased, and, though by parity of reasoning the producer and not the consumer got the benefit of the reduction, that increase of consumption is ascribed entirely to the reduction. But when in 1900 the twopence was re-imposed, the consumption does not seem to have fallen off—at least the deputation did not venture to assert so much, even when that rather serious flaw in the argument was pointed out by the Chancellor of the Exchequer. There are very good reasons for the depression in the tea industry, and these reasons must operate, no matter what the duty may be. The chief reason is over-production. More tea has been put on the market than the public want to buy, and the price has fallen as a matter of course. Not only so, but it is admitted by the deputation that the planter can at will produce, within certain limits, more tea of a poorer quality or less tea of a better quality. It seems that the growers have put quantity before quality, and have spoilt their own market. The remedy rests with themselves, says the *Times*. Let them consult at once their own interests and those of the consumer by growing less tea of a better quality.

FOREIGN COUNTRIES.—The wheat crop of ARGENTINA last season was, for the first time in fifteen years, sown on a reduced, instead of an increased, area. The official figures are 8,141,300 acres for 1901, against 8,347,980 for the crop of the previous season. The greatest expansion of the wheatfields took place between 1892 and 1898, in which period the area nearly doubled. Since the latter year there has been no considerable advance, and this year may be the first of a series of years of decline, for, with a poor yield, the financial condition of farmers will be critical, especially as the once promising maize crop has been badly injured by drought. A good deal of the land that has grown wheat continuously for several years must be partially exhausted by poor farming, and the only chance of recovery lies in the cultivation of new soil. Evidence of this is afforded by the superiority of the yield in the Province of Buenos Ayres to that of Santa Fé in the last two seasons, the latter province having by far the larger area of old-farmed land.

Emigration to CANADA.—In consequence of the large number of enquiries received from persons who contemplate settling in Canada this spring, the Canadian Government has made arrangements whereby a series of parties, accompanied by an experienced official, will be despatched from Liverpool at regular short intervals, commencing on March 13th. Full details, handbooks of Canada, and other information will be furnished on application to the Curator, the Canadian section, Imperial Institute, S.W.

The following are the dates of sailing of the different vessels leaving Liverpool and Glasgow for Canada during March, April and May. Those who decide to join any of these parties must book their passages through the usual channels.

From Liverpool:—

1. March 13th . Allan Line s.s. *Parisian*, in charge of Mr. John Webster.
2. March 25th . Elder Dempster Line s.s. *Lake Superior*, in charge of Mr. Robert Johnston.
3. April 3rd . Allan Line s.s. *Numidian*, in charge of Mr. G. H. Mitchell.
4. April 15th . Elder Dempster Line s.s. *Lake Champlain*, in charge of Mr. C. F. Just.
5. April 22nd . Elder Dempster Line s.s. *Lake Manitoba*, in charge of Mr. E. O'Kelly.
6. May 1st . Allan Line s.s. *Tunisian*, in charge of Mr. W. L. Griffith.
7. May 13th . Elder Dempster Line s.s. *Lake Megantic*, in charge of Mr. A. F. Jury.

From Glasgow:—

1. March 21st . Allan Line s.s. *Sardinian*, in charge of Mr. Thomas Duncan.

LABOUR RETROSPECT.

UNITED KINGDOM.—No little stir has been caused in labour circles by the actions at law which have arisen from the decision in the House of Lords making the funds of trade unions liable for the acts of their officers and members. Firstly, the Taff Vale Railway Company are suing the Railway Servants' Union for £24,000, as damages sustained through the strike in 1900. The Welsh coal-owners claim £70,000 from the South Wales Miners' Federation for ordering "stop-days." At Blackburn also a firm of cotton-spinners is suing the Weavers' Union for alleged damages through a strike. The proposed new agreement in the engineering trade has not come to pass, the employers' terms having been refused by the men by an apparent majority of two to one. The result of the ballot shows 9,714 votes in favour of and 16,563 against the agreement, but it is pointed out that there are 110,000 members of the three unions concerned, and only one-fourth of them have voted. Trade unionists always vote in strength when deeply concerned about any matter submitted to them; the reasonable inference seems to be, therefore, that the other three-fourths are not opposed to the measure, and probably did not take the trouble to vote because they thought their executive would receive all the support it needed. The men's objections are supposed to be due to the absence of provision for the payment of the day-work rate of wages to those asked to do piece-work. The employers, however, proposed a guarantee of "increased earnings for increased production due to additional exertion." In view of the foregoing considerations there is every possibility that further discussion of the terms may bring about an agreement. An improvement in the conditions of employment of railway servants should result ultimately from the motion passed recently in the House of Commons. It was "that the Government should exercise their power to call for returns of the hours exceeding twelve worked by railway servants, and of cases where work is resumed with intervals of less than nine hours."

COLONIES.—The commission from CANADA sent to induce emigration to the western provinces of the Dominion has been so successful that about 3,000 persons are starting this month, and others are expected to follow at the rate of 4,000 a month up to the end of the half-year. Under the arrangements now completed a would-be emigrant can join a personally-conducted party, which will be under the charge of an agent of the Dominion Government from the time of leaving Liverpool or Glasgow until Winnipeg or some still more western point is reached, the total cost of the journey being less than £8. Arrived at his destination, the emigrant could remain in one of the various "homes" set up by the Government until he had found employment, or had settled down, merely paying for his board, and if he took out wife and children the entire family would be so accommodated. No doubt is entertained that anyone wishing to obtain work on a farm would be able to get it almost at once, with the help of the local agent of the Government, which help would be freely placed at his disposal. Should he be in a position to take to farming on his own account, the Government would grant him an allotment of 160 acres, free of charge, but subject to certain conditions as to residence and cultivation. There is a great demand for farm labourers, and the wages paid in Western Canada are about the same as in the United Kingdom, but the difference is that in the former case the agricultural labourer would get his 160 acre allotment in addition, and should, in course of time, be able to set up a farm of his own. Those who are contemplating emigration, might draw a lesson from the encouraging attitude of the Finns, Germans and Scandinavians. These settlers, many of whom have chosen the district of Sudbury, are sending passage tickets for their connections and friends in their old homes in order to induce them to come out. Part of the Welsh settlement, who have endured such hardships in Patagonia, are desirous of migrating to Canada, and a deputation waited on Mr. Chamberlain, with the object of obtaining aid from the Imperial Government in reaching their new destination. The Colonial Secretary stated that he had been under the impression that the Welsh colonists wished to settle in South Africa. Had this been the case, the matter could have been dealt with by his Department, and it would have been his duty to further their wishes. It was Lord Milner's intention to prepare and submit to the Imperial Government, a scheme of colonisation and settlement under which the new colonies would undertake considerable liabilities. Colonists would, no doubt, be offered suitable land and assisted with loans. It was with an idea of this kind in view that he had consented to receive the deputation, for he should very much rejoice to have a colony of loyal Welshmen in South Africa. But the fact of these settlers wishing to emigrate from Patagonia to Canada put him in a position in which he was powerless to render assistance. For many years the Government had not assisted emigration to self-governing colonies. He had no doubt these people would find a happy and prosperous home in Canada. Possibly the Canadian Government might favourably consider an application for a loan, to be devoted to transportation purposes. Failing this, Mr. Chamberlain suggested a subscription list being opened. This was accordingly done, and a generous response was the result. With respect to the demand for skilled artisans in Natal, and the agitation regarding the immigration laws, Sir Walter Peace, the Agent-General, has made a statement. He says the system at present in force applies only to the families of men who are already settled in Natal. They nominate the women and children they wish to be introduced, adults being allowed £5 each, and children under twelve years of age £2. 10s. each. He had received a telegram from the Prime Minister, informing him of the great demand in the colony for artisans in the building

trades. A deputation of employers waited upon the Premier at Maritzburg recently, and offered a guarantee of employment to suitable men in the following branches:—Carpenters, at 14s. per day; bricklayers, at 15s. per day; stonemasons, at 17s. per day; plasterers, at 17s. per day; and painters, at from 10s. to 13s. per day. He gathered that this statement simply represented the condition of affairs in Maritzburg. There was undoubtedly a much larger demand in other parts of the colony. The Prime Minister informed him that there was a considerable and growing demand in Durban. Some of the telegrams spoke of 400 being wanted there alone. His own private advices had been, for some time, that building operations in that neighbourhood had been very much restricted for want of workmen. The cost of living had not increased in proportion to the increase in wages, and, with such wages as he had quoted, it was not a question as to whether a man could live well upon them, but merely as to how much he could save. Many a workman could live there comfortably, and save from 5s. to 10s. per day, after paying his board and lodging. Although the present demand for labour came mainly from the building trade, it applied also, in some measure, to other industries throughout the colonies, for most trades there are brisk. The building boom is partly explained by the necessity of re-building demolished buildings and railway bridges in various parts of the colony, and also by the revival of trade and the prospect of an increased population in the near future.

Mail advices make clear several points regarding the administration of the Immigration Restriction Act in AUSTRALIA. Power is given for the searching of any vessel suspected to have a prohibited immigrant on board, and where the officers administering the Act desire a medical examination, they may detain such people for 24 hours if necessary. Any person domiciled in the Commonwealth who wishes, on his return, to be exempted from the Act, may apply to the Collector of Customs at the port of departure for a certificate of domicile. It is understood that the Immigration Restriction Act is to be accepted as an addition to the Acts relating to alien immigration in force in the various States. Special care will, without doubt, be taken to exclude Chinese. A number of Italians who were debarred from landing at Perth have been allowed entry at Melbourne, the authorities being satisfied that they are eligible colonists. They are mostly vineyard labourers. It will be remembered that the clause regarding the educational test caused much discussion. It was worded as follows:—Any person who failed to write out and sign in the presence of the officer a passage of fifty words in length in the English language dictated by the officer. . . . It was pointed out, however, that this test would prohibit a desirable class of immigrants, such as German and Danish farmers, and the words "the English" were deleted, and the words "an European" were inserted in its stead. The Pacific Island Labourers Bill, which has been finally assented to, provides for the abolition of the traffic at the end of 1906, and the agitation against it is still being carried on, chiefly by those interested in the Queensland sugar industry. Sir Horace Tozer recently remarked, regarding the Kanaka labourers, that, being accustomed to life in a tropical country, they make splendid agricultural labourers—in fact, in planting, hand-weeding, thrashing and cutting cane in North Queensland, they perform work which the white man ought never to be asked to do. It is stated as proof of the necessity of Kanaka labour, that not 100 tons of sugar are produced annually in Queensland, in the production of which a Kanaka has not taken some part. An Act has passed the Queensland Legislature enabling the State to repurchase estates suitable for dairying, with a view to cutting them up into small holdings for close settlement. An Act has also been assented to enabling the State to grant special homestead areas, adjoining each other, to groups of settlers. The primary object of the measure was to meet the supposed requirements of a number of Bessarabians, who, it was believed, would emigrate to Queensland if the facilities for settlement in the same neighbourhood offered. Queensland has now followed the example of other States in adopting a measure to provide for advances being made to farmers.

FOREIGN COUNTRIES.—Affairs in SPAIN have gone from bad to worse, and the revolutionary labour movement has spread to an alarming extent. Barcelona, as usual, has been the centre of the disturbances. A strike of metal workers, dock labourers, carters, tramway men, and printers resulted in the closure of all factories and workshops, the non-union labour at the indiarubber works being the last to quit. Food became scarce, supplies being hindered by the rioters, who became so violent that troops were called out. There were many fatalities. The FRENCH coal strike has had a fairly immediate result in the passing of a Bill through the Chamber, securing an eight hours' day for miners. The disturbances were quelled and the strikers were resuming work at the end of the month. Considerations of health were urged on behalf of the measure, and the fact that long hours underground were exhausting. The other side put forward arguments regarding foreign competition and the smallness of profits, and succeeded in obtaining the introduction of a clause granting exemptions from the Bill's rules "on technical or economic grounds." The Bill has still to go through the Senate and, if it passes, the miners' day will in six months' time be limited to nine hours, which will be reduced to eight-and-a-half in two years, and to eight in four years. Although the railway strike in ITALY was arrested, the unemployed have adopted a threatening attitude, and further disturbances in Rome appear likely. The railway men thought better of leaving work, owing to the Government placing the men under military law.

The wave of inactivity which has been influencing Germany appears to be moving eastward, and the United States Consul sees every indication that AUSTRIA-HUNGARY is on the eve of a period of industrial depression. Until recently, iron, steel, electricity, petroleum, and nearly all other great industries seemed to be in a flourishing condition, the only apparent exception being the textile branch. Here, the crisis came more than a year ago, due to over-production. From the same cause the native petroleum refiners have just suffered considerably. In many of the iron and steel works in northern Austria, work has been reduced, and some establishments have notified their men that if orders are not soon received they will shut down. The Austrian locomotive works are short of foreign orders and prospects are gloomy. Car shops, furniture and tool factories, saw mills, and similar establishments are only partially employed, and the building trades complain of general inactivity. In order to bring relief, the Governments are disposed

to enter at once upon the execution of various public works, and to let out at once the contracts for such army supplies and railway rolling stock as will be needed. Regarding the alleged inducements offered by the Hungarian Government for industrial undertakings, the United States Consul at Budapest states that the experience of most foreigners has been that Hungary is not a profitable country for industry.

In TRIESTE, a dispute between the Austrian Lloyd Company and their stokers was made the occasion of a disorderly outbreak, causing serious dislocation of business. Practically all the workers of the city left their occupations. The tramway service and the goods traffic on the two railways were suspended: the foreign mails could not leave owing to the cessation of work in the harbour, and the newspapers ceased publication. There was evidently a section of the strikers who would not listen to the warning of their leaders against disorderly conduct, and these men, accompanied by the street loafers and doubtful characters which such occasions usually rouse to unwonted and misguided activity, displayed anarchical violence towards the military authorities who opposed their rioting. The Government had decided to resort to martial law, when an announcement was made that a settlement had been arrived at between the Austrian Lloyd Company and their stokers.

In the UNITED STATES the general industrial outlook remains satisfactory, and labour controversies have been few. Steel mills have been working full time in nearly all districts, and have orders on their books sufficient to guarantee a continuance of such activity for many months. In the coal trade a deficiency of skilled labour is reported. Wages generally have an upward tendency. Puddlers and finishers in all the mills controlled by the Amalgamated Association of Iron, Steel and Tin Workers have recently come in for a rise. A voluntary advance has also just been granted to glass workers.

SCIENTIFIC AND TECHNICAL DEPARTMENT OF THE IMPERIAL INSTITUTE.

RECENT EXPERIMENTS ON THE CULTIVATION OF TOBACCO.

The tobacco industry has become so highly specialised that it is necessary for the successful planter to become thoroughly acquainted with the scientific side of the processes involved in the cultivation and fermentation of this material. The qualities of the tobacco leaf as regards the size, shape, thickness, flavour and aroma, the grain and general appearance, are so easily influenced, and so difficult to control, that its cultivation in new localities can only be attended with success after much experimental work.

At the present time experiments are being undertaken in Ireland, on the culture of tobacco, by the Department of Agriculture. Some useful information on this subject is contained in Report No. 63 of the United States Department of Agriculture, and the following summary is compiled from this source. The report is a review of the experimental work conducted for some years past at agricultural experiment stations situated in widely separated localities, and is intended to throw light upon the various problems connected with the growth and cultivation of tobacco.

Methods of growing plants in seed beds.—At the Alabama State station various methods of starting tobacco seed were compared. Seeds were started in several beds, some open and others covered with cheese cloth. During the first year of the experiments the greater number of plants in the open beds were destroyed by a spell of cold weather, and during the second season they were injured by the flea beetle. In the covered beds the plants came up well, grew rapidly and were not subject to insect attacks. From these results it is evident that under the climatic conditions of Alabama young tobacco plants are readily affected by low temperatures, and quickly killed by frosty weather. At the Colorado station, in pursuing this work it was found that it took no longer to produce plants suitable for setting out by growing seeds in cold frames than by the use of the hotbed.

The following method of germinating the seed at the Georgia station proved very successful. The seeds were placed in wine glasses and soaked in water for half-an-hour, the water was then poured off,—the glasses placed in saucers containing water, and a tumbler inverted over each glass so as to confine the moistened seed in a damp atmosphere. In about a week, when the seed had started to germinate it was sown in a cold frame, and within a month from that time plants suitable for transplanting to the fields were obtained.

In the experiments conducted at the Central Experimental Farm, Canada, the seeds were sown in hotbeds, and some of the plants thus obtained were transplanted to cold frames before being set out in the fields. A striking difference was noticed between the plants set out from the hotbeds and those transplanted to the cold frames prior to setting out. The latter were stronger and grew more rapidly than those taken direct from the hotbeds. It was also found that if the plants were transplanted to a second hotbed before setting them out in the fields, the vigour was increased and the number lost in transplanting was materially reduced.

In the districts where fungoid diseases gave any serious trouble it was found quite possible to sterilise the soil used for the plant bed. Boiling water, hot stones, or steam under high pressure may be used for this purpose.

The size, weight, and condition of ripeness of the seed, as well as the method of planting, has been shown to have an important bearing upon the crop.

Varieties of Tobacco.—At Calhoun, the North Louisiana station—ten varieties of tobacco, namely, Conqueror, Hester, Long-leaf Gooch, Ragland Improved, Sweet Oronoko, White Burley, Comstock Spanish, Persian Rose, Improved Havana, and Brazilian American, were tested. Of these Comstock Spanish, Persian Rose, Improved Havana and Brazilian American, are cigar-leaf, and the rest are described as bright-leaf varieties. The last-named, with the exception of White Burley, produced a leaf which, when cured, was of a lemon yellow colour; they were more successful than the cigar-leaf varieties which, when cured, produced leaves too bright and in but small quantity.

It was also shown that Conqueror, Long-leaf Gooch, Hester, Oronoko, and Ragland Improved, cured brighter than other bright-leaf varieties, and that Vuelta de Abajo, Havana, Seed-leaf, Imported Havana, Choice Havana, Little Dutch, and Pumpelly, produced a leaf of greater silkiness and finer texture than other cigar varieties tested.

The kind of tobacco which can be grown in any district depends partly upon the climatic conditions and also upon the character of the soil. In testing varieties, therefore, consideration should in the first place be given to the type of tobacco adapted to the locality, to the soil, and the grade which the climatic conditions and soil may reasonably be expected to produce.

Influence of distance in Planting.—A study of the relation of distance of planting to yield and thickness of leaf, was made at the Wisconsin station. Plants were set 20 inches apart in rows 31 and 36 inches apart, and at intervals of 24 inches in rows 42 inches apart; close planting was found to increase the yield, and the plants nearest together in the row produced a thinner leaf than those further apart; but lessening the distance between the rows did not have this effect. A distance of 31 inches between the rows was sufficient for the full development of the plants. The surface area of the cured leaves per pound from the closest planting was 42.01 square feet, and from the widest planting 40.86 square feet.

Other experiments made with a view to ascertain to what extent close planting may be advantageously practised, showed that planting 1 foot apart in the row was not too close for Wilson Hybrid, the variety grown in this experiment. From these and other experiments it was concluded that too close planting interferes with the development of the leaves, while too large spaces between plants tend to produce coarse leaves. The dimensions of the leaf, thickness, elasticity, and size of the veins may all be more or less modified by giving the plants space or increasing the number in a row.

Fertiliser Experiments.—The results of experiments at Kentucky indicated that potassium, chloride, and sulphate, gave equally good results as fertilisers for tobacco, and that sodium nitrate produced a better quality leaf than other forms of nitrogen.

Tests with complete and incomplete fertiliser applications were also made. A yield of 1,460 lb. of cured leaf per acre was obtained after an application of 80 lb. of sodium nitrate, 80 lb. of dried blood, 160 lb. potassium chloride, and 140 lb. of double superphosphate per acre, whereas by doubling the quantity of fertiliser the yield of leaf was increased to 1,620 lbs.

Fertilisers used on soil in a good state of fertility, were found to increase the yield of tobacco considerably, and potassium chloride proved more efficient than the carbonates of potassium and magnesium.

At Calhoun experiments were conducted on red sandy and grey sandy soils, and it was shown that potash had little or no effect on the crop, but nitrogen, either in the form of sodium nitrate, ammonium sulphate, cotton-seed meal, or dried blood, caused a marked increase in the quantity obtained. An application consisting of cotton-seed meal, acid phosphate, and sulphate of potassium produced the best quality leaf.

The effects of different fertilisers on tobacco were studied at the Virginia station. Five plots manured with complete fertilisers, all of the same cost per acre, were compared with an unmanured plot. Dried blood gave the largest yield and the best financial returns as a source of nitrogen. The tobacco grown without fertilisers ripened ten days to two weeks later than that grown with fertilisers.

Influence of Time of Harvesting.—These experiments were undertaken at the Wisconsin Station to determine whether the tobacco leaf increased in size and thickness, and whether the loss in curing diminishes, when the plants are allowed to stand a considerable time after topping.

The results showed that when the plants were permitted to stand 32 days, as against others allowed to stand only 18 days, the thickness and dry matter of the leaf tended to increase, and the yield has a like tendency, *i.e.*, after curing, a greater weight of the leaf was obtained, but the area per pound of leaf was less.

It was thus possible to vary the commercial grade, and influence the price considerably, by harvesting the crop at different stages of maturity. This was one of the methods by which the quality of tobacco might be sensibly controlled.

Effect of Priming Tobacco Plants.—Priming, which consists in removing the leaves from the stalk of the plant as they mature, has a marked effect on the growth and chemical composition of the upper leaves. The removal of the lower leaves causes an increase of growth in the upper, and also a higher percentage of nitrogenous matter and nicotine. Priming is believed by many practical growers to be the proper method of harvesting the cigar- and cigarette-types, for in this way the leaves are uniformly matured and the subsequent product is consequently of a more uniform character. The priming of tobacco is more expensive than cutting the stalk, as more labour is required, but the improvement in quality fully warrants this additional cost.

Experiments in Topping Tobacco were conducted at the Central Experimental Farm at Ottawa, Canada, in order to determine how the time of topping, and the number of leaves left on the plants, affect the yield. The plants were topped July 20th and 26th and August 2nd, and on each date one plot was cut back to nine leaves and another to eleven leaves per plant. The larger yields were obtained from the latest topping, and the greater number of leaves per plant. The time and manner of topping has a great influence upon the character of the leaf produced. As a rule the earlier a plant is topped and the lower it is cut, the heavier, richer and darker-coloured the leaves become. This is a decided advantage for some crops, but a disadvantage to others.

Diseases of Tobacco.—The diseases to which most attention has been given manifest themselves during the curing process, and are commonly known as "stem rot" and "pole burn" or "pole sweat." The latter makes its appearance as small dark spots on the surface of the leaf near the veins and midrib, where moisture is most abundant. The disease is supposed to be primarily due to a fungoid growth which attacks the leaf on the surface and gives access to a bacterial process of decay by disintegrating and partially destroying the leaf tissue. It has been ascertained that moisture and temperature have a marked effect on the activity of these organisms. Decreasing the amount of moisture lowered their vitality, and a temperature up to 70° F. or even 90° F. favoured their development, while a temperature of over 100° or 110° F. and below 35° or 40° F. temporarily or permanently checked their vitality.

From investigations it was concluded that under the atmospheric conditions most favourable to the development of "pole sweat," the temperature and moisture in the interior of a closed barn could be regulated by artificial heat so as to reduce to a minimum the liability of tobacco to damage from fungi or other like organisms.

"Stem rot" is a fungoid disease which frequently affects the stems of the plants in the last stage of curing. No special experiments were made upon this disease, but as a remedial measure it was suggested that when the crop is cured all stems and refuse attacked by stem rot be burned before the fungus has matured, and the barn fumigated with sulphur immediately after curing, and again before the harvesting of the next season's crop.

Experiments in curing Tobacco.—Tobacco goes through certain processes of fermentation from the time it is cut until it is ready for the manufacturer. During this time it is said to be curing and ageing. After the harvest the leaves are speared upon laths and hung in a barn to dry. Artificial heat is often employed for this purpose. Experiments with different methods of curing tobacco have been conducted at several experimental stations. At the North Carolina station, the ordinary method of cutting down the plant and curing it with the leaves on the stalk proved less profitable than curing by the Snow process, in which the leaves are cut from the stalk as they ripen, and cured separately. A greater yield was obtained with the tobacco cured by the leaf process and the quality was better. This effect is ascribed to harvesting the leaves as they became mature, while, by the stalk process, many of the lower leaves were over-ripe, and the upper leaves still green at the time of cutting. It was found that the time and temperature required for curing leaves from different parts of the plant varied according to their ripeness, and for this reason the leaf-curing proved the most

desirable method, as the leaves were all of the same degree of maturity. At Wisconsin it was found that the loss of water in curing was about 71 per cent. of the weight of green leaf.

It is stated that the changes in the colour of the leaf during the curing process were not directly due to the loss of moisture, but depended largely upon the degree of ripeness—the riper the leaf, the lighter in colour it would be when cured.

From data obtained in this work it was concluded that tobacco should be cured in as moist an atmosphere as possible, without incurring damage from "pole burn." A temperature within the curing house not exceeding 75° F., and a degree of humidity among the plants represented by a wet bulb depression of 2°, were regarded as suitable conditions. In order to maintain these requirements, the plants should be evenly distributed in the curing-house, in order to equalise the humidity of the building, and the ventilation should be under perfect control, with a provision to regulate the humidity of the air by the use of artificial heat.

Fermentation of Tobacco.—The fermentation or sweating of tobacco is carried out in several ways. To give a general idea of the method of procedure, that followed in Florida may be cited. After the tobacco is cured, the leaves are stripped from the stalk and made up into hands, *i.e.* bundles tied together at the base. These hands are either piled on the floor or put into bins, and the fermentation allowed to proceed gradually. The temperature of the pile gradually rises, until it reaches its maximum, which is sometimes as high as 180° F. From this point the temperature gradually subsides, and finally attains the normal temperature of the room.

In connection with the changes which take place during the process of fermentation, most attention has hitherto been given to the loss in weight of the leaves and to the chemical changes which occur. At Connecticut State station the weight and chemical composition of cured and fermented leaves was compared. The loss in the fermentation of upper leaves, short seconds, and first wrappers was 9.7, 12.3 and 9.1 per cent. respectively. About three-fourths of the loss in the short seconds consisted of water, the upper leaves lost almost the same proportion in dry matter, and in the first wrappers the loss of dry matter was a little less than that of water.

The nitric acid, ammonia, fibre and starch contents of the leaves were affected very little by the process of fermentation, and the chief loss of dry matter was found to have occurred in the nicotine, albuminoids, and amide bodies, nitrogen free extract and ether extract. At the Pennsylvania station it was found that the loss in fermentation was greater with tobacco fertilised with barnyard manure than with tobacco grown with other fertilisers.

When it is considered that, commercially, tobacco is divided into four classes, *viz.*: cigar, cigarette, snuff and export, it becomes evident that the systematic observations as briefly described are invaluable to growers, who must, of necessity, produce tobacco suitable to the requirements of the market.

THE LAC INDUSTRY OF INDIA.

The resin and dye produced by the lac insect, *Tachardia lacca*, have been employed by the natives of India from very remote times, references to these materials being known in Sanskrit literature at least 4,000 years old. Formerly the dye was the more important product, and at one time to a considerable extent supplanted cochineal, even in European dyehouses, but with the advent of the coal-tar dyes, both these natural dyestuffs have practically passed out of use, and lac dye is now merely a bye-product in the manufacture of shellac. The information available regarding the life history of the insect, the chemistry of the resin produced by it, and the statistics of commerce in this material, have recently been collected in a special number of the *Agricultural Ledger* (No. 9, 1901), from which the following *resumé* has been compiled.

The insect which produces lac belongs to the zoological order *Hemiptera* and is, therefore, a near relative of the cochineal insect. Like the latter it inhabits by preference special trees, such as *Butea frondosa* (palas), *Acacia arabica* (babul), *Pterocarpus marsupium* (kino tree), *Shorea robusta* (sal tree), *Sisyrinchium jujuba*, and various species of *Ficus*. On the young twigs of such plants the larvæ settle, and fix themselves by inserting their hollow probosces in the bark and so suck out the sap, which, in the process of digestion, undergoes considerable change, and is excreted in the form of a resin with which each larva rapidly becomes completely incrustated. Meanwhile the larvæ, which were at first apparently all of one kind, have developed into insects of two sexes, the males being winged and the females wingless. The former escape from their resinous incrustations, while the latter produce eggs and complete their life history in the position first taken up by them. Each female produces about 1,000 eggs, the formation of the latter being preceded by the appearance of a bright red colouring matter which is probably intended to serve as nutriment for the young larvæ, since these remain *in situ* until mature and able to creep to a new portion of the twig, where they repeat the life cycle outlined in the foregoing paragraph. Where the lac insect is propagated for the sake of its resin, the twigs are cut just before the larvæ are mature, and these cuttings are placed on fresh twigs which then rapidly become infested by the escaping swarms. Two broods of larvæ are produced each year, the first early in July and the second early in December. The most serious enemies of the lac insect are ants and moths, since the former attack the females in order to obtain the sweet juice upon which the larvæ are fed, while certain species of moth eat both the females and the young larvæ. These pests are difficult to exterminate, since the application of any of the usual insecticides would destroy both victim and aggressor.

It is uncertain whether or not the continued propagation of the lac insect upon trees seriously injures the latter; according to Sir William Jones (*Asiatic Researches*, II. 1789, 361), trees are frequently destroyed in this way, but McKee (*Indian Forester*, Vol. I. page 269), is of opinion that no great harm is done, although, probably, both the host and the insect benefit when the tree is regularly pruned in order to encourage the formation of new branches, and Ridley (*Indian Forester*, XXII., 440), has shown that in many cases the damage to the tree is done not by the insect but by the carelessness of the native lac collectors.

In the original article, which extends to 350 pages, a considerable amount of space is devoted to descriptions of the methods of propagation and collection in vogue in the different provinces of India and to the extent of the local trade, but as this portion contains no information of general interest it may be omitted from the present summary.

The lac is collected just after the swarming seasons by cutting off the twigs bearing the resinous incrustations, which are often sold in the bazaars without further preparation under the name "stick lac." In the native factories this material is crushed in grain mills, whereby the resin is ground into a rough powder, which is freed from wood and refuse by sifting, so forming seed-lac; the latter is then macerated for a day in water and finally ground under water in an exceedingly primitive manner. The liquor so produced is of a bright purple colour, and is the source of the lac dye which was formerly an article of commerce. The washed seed-lac is next mixed with a certain small quantity of orpiment, in order to give the finished shellac a pale straw colour, and about three per cent. of common resin is added in order to lower the melting point and make the material workable in the processes through which it subsequently passes. The mixture is then packed into a narrow cloth bag from ten to twenty feet in length, which is held in front of a long shallow coke fire whereby the resin is melted. The bag of resin is manipulated by two men who twist it in opposite directions,

causing the material to ooze out, and as it drops it is collected on the plantain leaves with which the floor of the room is covered.

The masses of soft resin adhering to the plantain leaves are once more heated, and a piece of aloe leaf attached to one end, whereby the operator can stretch the soft resin in all directions, forming ultimately a large sheet of uniform thickness.

In the better class of factories the plantain leaf has been abandoned in favour of polished tiles, and the stretching is done by attaching the warm masses of lac to hot zinc rollers, but the final stretching is still accomplished in the old-fashioned way. Finally the sheets are carefully inspected, and all dark coloured or dirt-impregnated pieces broken out.

As regards the chemistry of shellac, practically nothing is at present known, and the *Agricultural Ledger* article merely gives a summary of the results obtained by John, Unverdorben, and Tschirch and Farner. Of these, the work of the two first-mentioned chemists was accomplished many years ago, before methods of attacking such difficult problems as the constitution of resins had been evolved, whilst the investigation conducted by Tschirch and Farner was of a very superficial character, as the following summary shows. These authors found that the specimen of shellac with which they worked contained 74 per cent. of true resinous matter and small quantities of lac dye, moisture, and inorganic impurities. The resin consisted of two distinct substances, one soluble in ether and the other insoluble. To the former they assigned the constitution of an ester of a resino-tannol and aleuritic acid, whilst they regarded the second as an indifferent substance, and named it crythrolaccin, since it formed yellow spangles which, on heating, sublimed and condensed to red needles. Aleuritic acid was regarded as a paraffinoid acid, and therefore the authors assumed that shellac and amber differed from all other resins in this respect, an assumption scarcely warranted by our meagre knowledge of the constitutions of the resin acids.

A series of analyses of seed-lac from Assam is published by Mr. Hooper, showing that the amount of resin contained in this material varies according to the care which has been exercised in grinding and sifting it, the finest powder containing the highest percentage of resin. The bleaching of shellac by chlorine, sulphur dioxide, carbon, and other agents is also described, and outlines of the processes suggested by various manufacturers are given; but no explanation is offered of the fact that much of the bleached shellac of commerce is usually insoluble in alcohol, and therefore useless for varnish making.

The shellac of commerce usually contains a small amount of the wax, simultaneously produced by the insect. This substance was investigated by Benedikt and Ulzer in 1888, and shown to consist essentially of the palmitic and stearic esters of myricyl and ceryl alcohols, and is therefore somewhat like beeswax in composition, but so far it has not been used for similar purposes; Hooper suggests that its hardness and stability render it an excellent material for seals to be attached to documents.

THE INDUSTRIAL AND ART USES OF LAC.

The native artisan employs this resin for a bewildering variety of purposes, but especially for the ornamentation of wood and metal work, to which it is applied either in the form of a varnish or melted. In the latter case the skilled worker, by employing lac coloured by aniline dyes or inorganic pigments, is able to produce complicated and artistic designs with very primitive apparatus. The original article gives an interesting account of the various ways in which this lac decoration is accomplished, but an adequate summary would occupy much space, and, moreover, would only interest specialists in wood work, so that it may for the present purpose be omitted. In addition to this, the most general outlet for the resin in India, it is used as a bed for hammering out gold and silver by native smiths, while lapidaries employ it for the embedding material of their grindstones. Cheap ornaments and toys are made from it, either entirely or with a thin external coating of more valuable material. Lac dye is still employed to a small extent by native tanners and wood-stainers, whilst Hindoo ladies often use it to stain the soles of the feet and palms of the hand. In Europe and America the resin, in the form of shellac, is one of the most common ingredients of the spirit varnishes and polishes used in cabinet-making and the manufacture of hats, whilst concentrated solutions in methylated spirit are often employed as cements. The following statistics compiled from the official returns show the extent of India's export trade in this material:—

SHELLAC.						LAC-DYE.
Year.	Total Export.	Value.	To United Kingdom.	To United States.	To Continental Ports.	Total Export.
	Cwt.	Rupees.	Cwt.	Cwt.	Cwt.	Cwt.
1876-1877	89,880	42,20,497	—	—	—	19,051
1884-1885	106,747	45,36,326	68,654	21,152	15,413	106
1897-1898	189,329	92,86,795	82,291	53,698	51,069	Nil.
1899-1900	195,239	92,65,600	60,257	79,615	52,102	1

These figures are of particular interest, as showing the remarkable decline in the export of lac dye which followed the introduction of synthetic dyes, and as illustrating the fluctuations in the price of shellac. A third curious feature is the falling off in the export to the United Kingdom, which is explained by the corresponding increase in the shipments to continental ports, since continental importers now generally buy direct from Calcutta instead of via London, as was formerly their custom.

SOFT PORK.

Canada, during the year 1900, exported bacon to England of the value of \$12,000,000. Among the qualities necessary for first-class bacon in England none is of greater importance than firmness, any tendency to softness or tenderness being quite sufficient to rate it at second-class prices, and, if this softness is at all pronounced, to make it unsaleable at a profit. These facts have led the Canadian agricultural authorities to make an investigation into the character and causes of soft pork, this detrimental character having been especially developed in the produce of certain districts. Five series of experiments were made, during 1899 and 1900 respectively, at the central experimental farm, Ottawa, consisting of feeding trials, followed by a chemical examination of the pork produced.

The first step was to ascertain the difference in composition of firm and soft pork, so that chemical analysis might be employed as discriminating agent of the quality. Samples of the two qualities were taken, and the olein determined in the dry filtered fat, when the following results were obtained:—

	Firm.		Soft.	
	Loin.	Shoulder.	Loin.	Shoulder.
	%	%	%	%
Olein (calculated)	63.71	64.40	79.95	80.18
Palmitin and Stearin	36.29	35.60	20.05	19.82
Ratio of Palmitin and Stearin to Olein	1:1.76	1:1.80	1:3.99	1:4.02

These figures show very clearly that the fat of soft-bacon contains a much smaller proportion of solid fats, palmitin and stearin, which explains its characteristic flabbiness. The fat of immature pork was found to contain more than the average amount of olein, and was consequently more or less soft. The fat of bacon classed by porkers as very firm contains 68 per cent. of olein or less, while very soft contained 75 per cent. or more.

In the first series of experiments the influence of the character and quantity of food given to the animal, its age when slaughtered, of exercise and locality, upon the development of fat were determined. In the second series it was considered unnecessary to repeat the details as regard eastern and western origin, limited and unlimited ration, and exercise, as these factors exerted very little influence on the firmness of the resulting pork, and only the effect of varying ration was determined. A summary of the results is given in the following table, beginning with the firmest pork. The figures relate to the fat derived from pigs fed on the given rations:—

Composition of Ration.	Olein.	Melting Point.
$\frac{1}{2}$ corn meal; $\frac{1}{2}$ oats, pease, barley ($\frac{1}{3}$ each), and skim milk; sugar beets	66.9	32.3 C.
Pease	67.2	32.5
$\frac{1}{2}$ corn meal; $\frac{1}{2}$ oats, pease, barley ($\frac{1}{3}$ each); skim milk and mangels	68.2	32.7
Oats, pease, and barley ($\frac{1}{3}$ each)	68.7	32.4
$\frac{1}{2}$ corn meal; $\frac{1}{2}$ oats, pease, barley ($\frac{1}{3}$ each) and skim milk; turnips	70.4	32.3
Corn meal and skim milk	70.9	33.3
$\frac{1}{2}$ corn meal; $\frac{1}{2}$ oats, pease, barley ($\frac{1}{3}$ each), and skim milk	72.3	31.1
$\frac{1}{2}$ corn meal; $\frac{1}{2}$ oats, pease, barley ($\frac{1}{3}$ each), and cooked pumpkins	73.3	31.4
$\frac{1}{2}$ corn meal; $\frac{1}{2}$ oats, pease, barley and artichokes	73.4	31.5
1st period, oats, pease, barley ($\frac{1}{3}$ each); 2nd, period corn meal	73.9	31.1
$\frac{1}{2}$ corn meal; $\frac{1}{2}$ oats, pease, barley ($\frac{1}{3}$ each)	74.6	30.3
1st period, corn meal; 2nd period, oats, pease, barley ($\frac{1}{3}$ each)	76.1	30.9
Corn meal only	83.6	28.6
Beans	84.9	29.5

The data obtained in the course of these experiments show clearly the kind of fodder supplied to the animal exercises profound influence on the composition of the fat produced, and it is remarkable that the food-material of such similar compositions as pease and beans should, in animal metabolism, give rise to such differences as are shown in the foregoing table. The practical investigation of the matter has, however, been carried on on a sufficiently large scale to afford conclusive and reliable results, and the production of bacon of the required quality would appear in the future to depend on the farmers adopting the fodders which produce least olein.

THE USE OF OZONE FOR STERILISING WATER.

Ozonised air has long been known to be a very efficient steriliser for water, although the dry gas has been found to possess little bactericidal power. Its use has, therefore, been suggested for the purification of potable waters, but the early experimental installations, which were erected at Blankenburg, Oudshorn and Paris, are reported to have been abandoned, and at present the process is only known to be in operation at Lille in France, at Bole in Mexico, and at Moscow in Russia. The method is a simple one, but hitherto the cost has been a considerable factor against it, though upon this point it has been difficult to get trustworthy figures. Recently, however, the process has attracted renewed interest, and one of the London water companies is at present conducting experiments with a view to introducing it here. Considerable interest, therefore, attaches to the publication of details regarding the working of the small experimental installation which was erected by Siemens and Halske, at Martinikenfelde, near Berlin, in 1898.

The ozonisers employed here are of the Siemens and Halske plate and tube type, and yield from 20 to 25 grams of ozone per E.H.P. hour, with an E.M.F. of 12,000 volts. Air is first forced through a drying chamber and then passes into the ozonisers, on leaving which it contains from 2.5 to 3 grams of ozone per cubic metre. It is then led to the base of the sterilising tower, a square structure packed with flints, and as it rises through these it meets a descending stream of the water to be sterilised, which has undergone preliminary filtration through sand. The plant in question is capable of treating 240 cubic metres of water in 24 hours (1 cubic metre is equal to about 220 gallons), and the results of the exposure to ozonised air will be seen from the following tests made with water from the River Spree. With a consumption of two grams of ozone per cubic metre of water, the number of bacteria per cubic centimetre was reduced from 600,000 to 10; the permanganate absorption figure was diminished by 18 per cent., and the aeration of the water was increased from 10 to 12 per cent.

The capital outlay for an installation capable of treating 150 cubic metres of water per hour is estimated to be £6,750, of which total the ozonisers and sterilising tower absorb £3,750. The actual cost of treatment for a plant of this size is given as 1.726 pfg. per cubic metre, and the total cost, including interest and depreciation, amounts to 5.031 pfg. per cubic metre, the latter figure being equivalent to about £11 per million gallons.

In addition it may be noted that Siemens and Halske have recently patented a method of clearing turbid water by the combined action of ozone and iron.

THE TREATMENT OF AURIFEROUS MISPICKEL ORES.

The ores worked at the Deloro Mine, in Ontario, are derived from several veins, the two principal being the Gatling and the Tuttle lodes, where the ore consists of quartz heavily impregnated with mispickel, and occasionally chalcopyrite and iron pyrites. It is treated both for its gold and arsenic contents. Other veins in which the ore is oxidized are being worked, and it is necessary to treat them in a different manner. The strike of the veins is nearly north and south, whilst the dip varies from 45° to 63° to the horizon. The average width of the Gatling lode is 4 to 5 feet, and the wall rock is talcose schist or diorite, the latter being the country rock. The fine crushing is performed by means of a series of stamps, with a capacity of 4 tons per day. As much of the free gold as possible is caught by amalgamation, the amount so obtained being generally 57 per cent. of the assay value. The pulp, after leaving the plates, is passed over 6 feet corrugated belt Frue Vanners, by means of which the sulphides and coarser particles are separated. These concentrates consist chiefly of mispickel with some iron pyrites, small amounts of copper, and 15 to 20 per cent. of quartz sand. The latter renders the dense concentrates more readily leachable. For leaching 2 lb. of potassium cyanide and $\frac{1}{2}$ lb. of cyanogen bromide are used per ton of concentrates, and the gold is precipitated from solution by means of zinc dust, of which 19 lb. is consumed per ton of concentrates. By these solutions an average of 90.5 per cent. of the gold content is extracted. After separation of the gold the concentrates are calcined for arsenic, and the arsenious oxide obtained after resublimation is quite white and practically pure. The production of the latter is 40 to 50 tons a month, which is the total American output of this material.

LECTURES AND PAPERS.

"THE ECONOMIC RESOURCES OF THE STRAITS SETTLEMENTS AND THE MALAY PENINSULA."

(By H. N. RIDLEY, Esq.)

SIR CECIL CLEMENTI SMITH presided, on the 16th December, at an illustrated lecture given at the Imperial Institute by Mr. H. N. RIDLEY, Director of the Botanic Gardens, Singapore, entitled "The Economic Resources of the Straits Settlements and the Malay Peninsula."

Probably, said Mr. Ridley, no portion of the Empire was so little known to the English public as the Straits Settlements and the attached Federated States. It was, however, one of the most thriving of the smaller colonies, and possessed, in Singapore, the most important port in Eastern Asia.

Its heavy rainfall, of over 100 inches annually, was evenly distributed throughout the year; so, unlike other tropical regions, there were no seasons. The trees, which were evergreen and for the most part bore flowers and fruits irregularly all the year round, grew with great rapidity; consequently it had been found more suitable to cultivate plants whose produce was derived from the vegetative portion rather than from the fructificative. The climate, though hot, was neither unpleasant nor unhealthy, and cases of sun-stroke were almost unknown. Coolie labour on the estates was supplied by Javanese and Tamils; the Chinese, though very industrious and invaluable when working for themselves in agriculture, commerce, or mining, had not been found amenable to European methods of discipline.

The greater part of the Malay Peninsula, which consisted of hills rising to about 7,000 feet altitude with more or less flat country running along the coast-line, was, or until recently had been, covered with dense forests; and the characteristic view from almost any of the hill-tops at the present day was one of endless trees, of which there were several thousand kinds, although to the casual observer they seemed very similar. These produced excellent timber, both hard and soft woods suitable for all kinds of purposes, while some of them, ebony and other ornamental woods, were suitable for cabinet work.

Among the trees of special interest Mr. Ridley mentioned the camphor, not the Japanese camphor tree from which the camphor of commerce was now obtained, but a much larger one, belonging to a different natural order, and from which camphor had originally been obtained some hundred of years before the discovery of the Japanese tree. This Malay camphor was obtained from the hollows of the trees, but it was very scarce and far too expensive to come into the London market. It was sought by the Malays with quaint ceremonies, and generally used in magic and religious ceremonials by both the Malays and the Chinese.

Wood-oil was obtained from certain of the large trees by cutting a hole in the trunk about a foot across and six inches deep and lighting a fire therein. This caused the oil to flow out, which was caught in tins and used as varnish. Owing, however, to the death of the trees the supply of the oil had become so scanty that it seemed nearly to have disappeared from commerce. The sweet-scented incense gum, benzoin, was also obtained from one of the Malay forest trees, and formed the chief element in the incense used in churches.

The most important of the Malay jungle products, however, was gutta percha, without which the submarine telegraph cables could never have developed to their present importance. This tree, the *Isonandra gutta*, was confined to the Malay Peninsula, Sumatra, Borneo, and the islands of the immediate neighbourhood. It was discovered in 1843, first being noticed on account of its property of becoming soft and easily moulded in hot water. Its high insulating powers, and resistance to sea-water, were soon noticed, and it very shortly was in great demand for electrical work, surgical instruments, and many other purposes. The tree was of very slow growth, but eventually attained great size. The gutta percha was obtained by felling the trees and cutting rings through the bark all up the trunks, when it exuded in the form of white milk, which was collected in leaves and set into blocks of different forms.

So great indeed had been the demand that every accessible tree of any size had been felled, not only by the Malays, but by the wild tribes who rambled all over the forests, and consequently in large areas no tree large enough to produce seed remained, and the plant was on the verge of extinction. The trees produced seed very seldom, and although Mr. Ridley had offered large prices for some none had been forthcoming. The Government of the Straits Settlements had consequently stepped in and taken measures for the protection of the remaining trees. The amount of gutta percha produced by felling and cutting was very small in proportion to the age and size of the trees; one upwards of a hundred years old would produce but 2 or 3 lb.

However, a Frenchman in Singapore had, about eight or nine years ago, discovered that, by drying the leaves and twigs of the tree, and grinding them to powder and then mixing the powder with water, the gutta percha floated to the top so that it could be skimmed off and pressed into blocks. He had started a factory in Singapore, which had, at his death, passed into other hands and had been eventually transferred to France, whither the leaves and twigs were now sent to be worked. By this simple method, and by growing the plant in the form of bushes rather than trees, it was hoped that in time the Malay Peninsula would be able to furnish the world with a good and regular supply of this valuable product.

The rattan was another important jungle product. It was the stem of a thorny, climbing palm which scrambled about and over trees by the aid of sharp hooks with which the leaves and flower-stems were provided. There were a great many different kinds of rattans, and Mr. Ridley gave an interesting account of the method of cutting them down and preparing them for shipment to Europe and the United States, for manufacture into chairs, baskets, etc. As the supply was hardly equal to the demand, the plant was now beginning to be cultivated, and a reasonable return might be expected with but very little expense.

Coffee was cultivated over a large area of the Peninsula, and the large seeded Liberian had been found to grow there very well indeed, and better than the more valuable Arabian variety; but, unfortunately of late, the price of Coffee had been so low that most of the planters were adding the valuable Para rubber tree to their estates. This tree, a native of the Amazon district in Brazil, had been introduced from Ceylon in 1884 to the Botanic Gardens in Singapore, where it has been found to grow with remarkable ease and rapidity, and to produce a very good yield of first-class rubber.

While coffee had been in the ascendant, however, the planters had not troubled themselves about rubber, but now, owing to the increased demand for the latter commodity, due in great measure to the rapid evolution of the bicycle and the motor-car, the attention of planters all over the world had been directed to this product. A large number of plants produced rubber, of one kind or another, but that from the Para tree was by far the best. Attempts had been made to cultivate this tree in many parts of the world, but with only partial success. In the constantly damp and warm climate of the Straits Settlements, however, it has grown with astonishing rapidity. A tree raised from seed attained its full height of 50 feet in five or six years, after which it continued to increase in girth to about 4 feet, in twelve years. The expense of cultivation was very small, no manure being required, and the tree could be tapped when six years old, when it would produce about 2 lb. of rubber a year. Older trees produce more. The rubber was obtained by cutting first a narrow channel through the bark vertically, with slanting ones leading into it all the way down the trunk of the tree, at the foot of which a little box was placed with the lid so arranged that, although the rubber-milk could get in, dirt and rain-water could not. The trees were tapped in the afternoon and the rubber collected from the boxes on the following morning. Every

day for a week, at 4 o'clock, a thin slice was cut off the edges of each slit, and more milk ran out until the tree was finally exhausted. The wounds were then left to heal, which usually took about one or two months. The trees could be tapped once or twice a year according to size, and the rubber thus obtained was worth from 4s. to 4s. 6d. a pound. Even at half that price the cultivation would be the most remunerative of any in the East, and thousands of trees were being planted all over the Peninsula as fast as the seeds could be procured.

The india rubber, *ficus elastica*, so common in pots in English houses, was being cultivated by many planters. Its appearance, however, was very different when grown into a large tree with great roots. It was a native of the Peninsula, and thrived well there, but its rubber was of less value than that of the Para.

Another paying crop, which was cultivated wherever the soil was sufficiently sandy for its growth—generally along the sea-coast, was the cocoanut; and large areas were devoted to its cultivation in Singapore, Penang, Province Wellesley, and elsewhere. In some places the trees were severely attacked by two kinds of large beetles, which burrowed through the shoots and soon caused the death of the tree. The destruction of trees, at one time, had been enormous, until a law had been passed compelling owners to destroy badly affected trees, and also the rubbish heaps in which one of the beetles bred. This law had had very beneficial results. The nuts were sold either for food, for which there was always a large demand, or as copra—made by splitting the nuts in two and drying the halves, which were used for the manufacture of oil and stearine.

The betelnut palm was also cultivated to a considerable extent, and although betel chewing had largely gone out of fashion in the Peninsula, there was still a considerable demand for the nut in India. It was also used to a small extent in European medicine.

The most useful of the palms, however, was the sago, which was planted in a good many places in the Peninsula. Three sago plants would give more nourishment than one acre of wheat, and one acre of sago as much as 163 acres of wheat; in fact sago gave a larger amount of food per acre than any plant in the world. The plant was grown from cuttings, or seeds, in wet swampy places, forming dense thickets, with its huge leaves 20 feet in length. The main stem crept along the ground and threw up great branch stems, about 40 feet high and 1½ feet through, which eventually produced at the top great panicles of flowers and fruits. The plant took twelve years to produce its first stem, after which its growth was more rapid, and fresh stems appeared regularly, so that at most times of the year, in a big plantation, there were generally stems ready to cut. These were felled when full size, but before the appearance of the flowers, and cut into pieces about two feet long. They were then split in half, the bark and woody exterior removed, and the sago manufactured from the inside white pith, first into sago flour and then into granulated or pearl sago. A full size stem would produce as much as 600 or 700 lb. of flour, and about 30,000 tons were exported annually from Singapore.

The tapioca plant was a tall, half-shrubby plant, resembling somewhat the castor oil. It was a native of South America, but had long been cultivated all over the East, and was very largely propagated from cuttings of the stem, which were just stuck into the ground, and, in a year or eighteen months, attained a height of about six feet, forming huge thick roots under ground. When these roots were of full size, the plant was cut down and the roots dug up and taken to the factory to be manufactured into flake or pearl tapioca. This plant was always cultivated by the Chinese. Only three crops were taken off the land. Its cultivation, often a very paying one, was said to injure the soil, and so was not one upon which the Government looked with much favour. Tapioca and sago were, of course, used for many other purposes than as food.

Gambier, cultivated entirely by the Chinese, was a climbing shrub. It was always grown in the open field in the form of bushes, which were severely cut every year. The branches and leaves were then taken to the boiling sheds, and, after going through various processes, the gambier was shipped to Europe for the use of tanners. Another, a totally different plant, the mangrove, produced a tan-stuff which was now finding its way into our markets. The mangrove was a tree growing on the edges of tidal rivers and sea-shores, wherever they were muddy. This particular tan-stuff was also used in combination with indigo as a dye-stuff by the Chinese. Indigo, however, was not a large or important cultivation in the Peninsula. It was only grown to meet a small local demand.

Pepper was another plant generally cultivated by the Chinese, usually by gambier planters. It was raised from cuttings and climbed up large stems or posts. Formerly it had been a highly priced article, but of late years had fallen off very much and its cultivation in the Straits had diminished. Now, however, the price had risen and the Chinese and Malays had recommenced planting.

The Straits Settlements were famous both for nutmegs and cloves, which were also chiefly cultivated by the Chinese. The nutmeg, as grown in the Straits, was quite a small bushy tree with deep green leaves and fruit resembling a small peach. When ripe the husk split partly open, exposing a black seed, covered with a beautiful scarlet net-work. This net-work, the mace, was taken off when the fruit was ripe and dried in the sun. It was often more valuable than the nutmeg itself.

This cultivation was an old established one. In 1848 Singapore alone supplied over four million nutmegs, but in 1860 a disease was developed which entirely destroyed the cultivation in that place, and nearly did so in Penang. European planters had been ruined, and their estates and houses sold for very small sums. The Chinese then started the cultivation in Penang, and had kept it up to the present time.

Mr. Ridley, not long ago, had his attention called to what he considered the same disease, and on investigation he found it due to a minute beetle which burrowed into the bark of the tree, beneath the ground, so that its presence was not noticed until, by its burrows, the cambium, or living layer of the bark of the tree, was destroyed and the tree appeared to die suddenly. Had this discovery been made in 1860 the cultivation could easily have been saved. This was, he said, an excellent example of the importance of the entomologist to the planter.

The most important native cultivation in Singapore was the pineapple. The plants grew from cuttings, placed close together, and completely covered the ground. The fruit, when ripe, was cut and brought into the town in cartloads to the preserving factories. The industry of tinning pines was a large and very remunerative one. By far the largest number of the best preserved pines in the markets of the world came from Singapore, where the price of a pine varied from ½d. to a penny a piece. The plants produced fruit nearly all the year round, were very easy to cultivate, grew in the worst of soils, and its only enemies were porcupines and wild pigs.

From the leaves of the pine a very beautiful fibre was extracted. The leaves of the ordinary varieties, however, were too short to be used successfully for this purpose, the most suitable leaves being from plants in waste ground that had grown up with grass and scrub among them.

The Malay Peninsula was remarkable, according to the mineralogist, for having given samples of almost all the known elements, but these were so sparsely and generally scattered over the whole region that the expense of collecting most of them would hardly repay the cost. Tellurium, wolfram, and titanium were comparatively common. Gold, silver, lead, zinc, copper, antimony, and other metals all occurred in small quantities widely scattered over the country; but little mining had been done except for gold and tin. In former years the Peninsula produced a good quantity of gold; the yield, however, at the present time was but small.

Tin was the mineral of the country, being found there in great abundance; in fact, more than one-half the world's supply was derived from the Peninsula. The greater part of the

mines were alluvial, though lodes had been found and worked. Rich beds occurred in the stream valleys at the bases of the hills in Selangor and Perak, and were worked by the Chinese, who dug to no great depth, and washed the alluvium with very primitive sluices. The tin was sold to European firms, melted into ingots at Singapore, and then exported.

In conclusion, Mr. Ridley said that in the course of a single lecture it would be impossible to give more than an idea of the great wealth of resource of the colony. He had attempted to describe rather the peculiar vegetable products of the country, so as to show what had been done in the introduction and cultivation of new and exotic plants during the last half-century. When Sir Stamford Raffles planted the English flag on Singapore Island in 1819, it had been inhabited only by about 200 fishermen and pirates; now it was the most important port in Eastern Asia, with a population a thousand times as large. Then the Native States had been in a constant state of war and anarchy, and the natural wealth of the country was neglected; now, owing to the energy of the white man, aided by the patient hard work of the Chinaman, the forests had been felled, mines opened up, cultivation introduced, and commerce developed. An era of justice, freedom, and peace to all had been inaugurated, and the country had become one of the most thriving of our tropical colonies.

There were still, however, large areas of country practically unexplored, and doubtless much mineral wealth untouched; and Mr. Ridley was of opinion that the colony was only really in its infancy, and that gradually and steadily the work of progress would continue year by year, and he was confident that the future of the Malay Peninsula would be one of great and increasing prosperity.

The lecture throughout was illustrated by a well-selected series of slides, many of which had been specially prepared.

The chairman, in proposing a vote of thanks "for a very attractive lecture," referred to Mr. Ridley's commendable simplicity of language, and to his avoidance of technical expressions, which had enabled all those present to carry away every single piece of information which he had been good enough to impart to them.

Sir Cecil Clementi Smith said he should like to take this opportunity of drawing attention to the work that Mr. Ridley, and the Directors of other Botanical Gardens, were doing in going out to the Colonies and devoting themselves with ardour and zeal to economic botany. They, in a quiet and unobtrusive way, were winning victories over nature of which the ordinary man in the street knew absolutely nothing. They did not get honours thrust upon them or mentioned in the newspapers, but their work was nevertheless of extreme value in forwarding our efforts of making human life more endurable and more delightful. Mr. Ridley's labours—only a small portion of which he could have referred to that evening—in experimenting on the cultivation of plants, and the similar work of the Directors of other Botanical Gardens, were of immense benefit to the Empire. Most people in this country knew Kew as a place where they could see beautiful and attractive things grow. It was, however, much more than that. The making the gardens attractive formed but a small part of the duty of Kew. It was a mighty organisation and the centre of the botanic activity of the Empire; and Mr. Ridley would probably be the first to acknowledge the great assistance he had received in his botanical efforts from the Authorities of the Royal Botanic Gardens, Kew.

"FEDERAL FULFILMENT."

(By The Hon. SIR JOHN A. COCKBURN, K.C.M.G.)

Admiral Sir EDMUND FREMANTLE presided, on the 27th January, at a lecture given at the Imperial Institute by Sir JOHN COCKBURN on "Federal Fulfilment."

To twine together into an efficient federal fabric the strands of six independent communities was, said Sir John, an intricate task, and patience, courage, and talent were necessary to the process. Abundant proof, however, of the possession of these qualities had been given by the Federal Government during the course of a year which had been brimful of events of paramount importance to Australia, and portentous to the Empire.

After making fitting allusions to the late Queen, one of whose last public acts had been to send a message of greeting and goodwill to the new-born nation; to the voyage of the Prince of Wales to open the Federal Parliament; and to the recent resolution of the Commonwealth Parliament making common cause against the slanderers of our soldiers—Sir John reviewed some of the more important events of the year.

The long desired consummation of Australian free trade had been achieved last October. As had been anticipated, the tariff combined provisions for producing revenue with moderate protection, a necessary resultant of the policy and requirements of the individual States. He had no doubt but that the tariff would pass the Commonwealth Parliament without any serious alterations. To some minds the proposals put forward might appear novel and even heterodox; the growth of necessary manufactures was to be encouraged by bonuses, and a rebate of excise was to be allowed on white-grown sugar.

Sir John was very enthusiastic with regard to this Federal Tariff, and contended that a middle course had been taken which was not only to be commended, but was, in fact, the only satisfactory one that could have been adopted.

Australia had a habit of knowing what it wanted, and generally took a pretty straight cut to the point to be reached. One thing with regard to the parliamentary representatives of the Commonwealth was worthy of comment, viz.; that they were drawn from every class of the community—certainly a most excellent sign for a new nation.

A good deal was said in the lecture about the labour problem, and of the action of the Federal Parliament in setting a term to the Kanaka traffic. This question of a White Australia was not confined to any class, but was a serious national matter. It was easy for those at a distance to lightly regard the prospect of racial admixture, but the Australians, having before their eyes the difficulty of the coloured problem in America and South Africa, did wisely to determine to profit by the experience of others in the direction of prevention being better than problematical cure.

Australia was only a few days' steam from the vast coloured populations of the Pacific, and the country was naturally apprehensive of a condition of things which might at any time result in the loss of the very object of Australia's existence—the upholding of the interests and traditions of the British in the Pacific, for the Pacific was going to be the great international arena of the future; and the loss to the Empire, if Australia were to become denationalised, could not be measured. No Government could have dared to have trifled with the question. In fact both the political parties in the Commonwealth Parliament claimed the copyright of the phrase "White Australia," and there was no class in the country that did not dread the possibilities of a large coloured invasion.

Although this action with regard to the Kanakas had been denounced by an influential class in Queensland, the decision had been inevitable; in fact the proposals of the Opposition party with regard to the recent coloured legislation had been, Sir John maintained, more stringent than those of the Government.

The decision not to subsidise steamers employing coloured crews had been regarded by some as a new development, but it was in reality the outcome of unanimous resolutions arrived at by the Australasian colonies at the Postal Conference in New Zealand in 1894, and Tasmania in 1895. It had been stated in the debates in the Senate that 25 years ago we had 200,000 white men in our vessels and to-day but 100,000. It was impossible to contemplate with equanimity the weakening of our mercantile marine as a potential naval reserve, and, in its patriotic stand against further depletion, Australia deserved well of the Empire.

The question of broken seals on ocean steamers' stores was a corollary of Australian Free Trade. Previously, vessels trading from one port to another port in the same colony had to carry duty-paid stores. Now, all the ports in Australia were on the same footing, being all within the Commonwealth, and, therefore, all inter-State steamers had now to carry duty-paid stores. As ocean steamers competed with these for the local traffic, it would seem to be unfair to allow a privilege to one competitor which was denied to another.

The Federal authority had studiously refrained from attempting to overshadow the States. At the Convention it had been decided, without a division, that the State Governors should continue to be the channels of communication between the States and the Imperial Parliament, and Mr. Chamberlain was too wise and too sympathetic an interpreter of the Constitution to ignore, for the sake of official convenience, so definite a landmark of autonomy.

The retention of the direct appointment of the State Governors by the Crown had secured the services of men so well able to maintain the dignity of the office as Sir George Clarke and Sir Herbert Chermiside; and Lord Hopetoun, by his perfect sincerity and earnest devotion to duty, had surpassed even the high expectations based on his previous record.

The tone of Sir John's lecture throughout was most optimistic, and he expressed himself thoroughly satisfied with the first year's achievements of the Commonwealth, which augured well for its future. At the conclusion of the lecture a number of slides were shown of the various statesmen who had been connected with the federal movement, of the Commonwealth fêtes, and of several of the industries of Australia.

Sir Edward Fremantle, in proposing a vote of thanks "for a most interesting, eloquent and attractive lecture," said that he entirely agreed with Sir John Cockburn as to the importance of maintaining the efficiency of the mercantile marine, and considered that it must on no account be allowed to decay. He had listened with great interest to the references made to Sir George Grey, whom he had known personally, and who had frequently been on board his ship when he had been in Australian waters.

"THE NATIVE RACES OF NIGERIA."

(By C. F. HARFORD-BATTERSBY, Esq., M.D.)

Mr. T. F. V. BUXTON presided on the 3rd ult. at a lecture given at the Institute by Dr. C. F. HARFORD-BATTERSBY, Principal of Livingstone College, on the "Native Races of Nigeria."

In his introductory remarks the chairman referred to the great interest that was now being taken in the expansion and consolidation of the British Empire, and also to the consequent responsibilities such dominion imposed upon us towards the millions of people, belonging to innumerable races and tribes, who were now our fellow-subjects. An added interest, however, attached to Nigeria, as it had only as recently as last year been taken over from the Royal Niger Company, who had governed it for about twenty years, and incorporated as part of the British Empire. Dr. Harford-Battersby possessed an intimate personal knowledge of the country about which he was going to speak, and since his return to England, necessitated by a breakdown in health, had in several directions taken an active interest in West African matters. He was the Principal of Livingstone College, an institution which provided elementary medical training for men who were, or who intended to become, foreign missionaries; and he was also the hon. secretary of the Native Races and the Liquor Traffic United Committee.

The development of the British Empire was, said the lecturer, a subject which had occupied the public attention to a remarkable extent during the last few years, and the recent addition to the title of our Sovereign indicated the recognition of the bonds which united us with our fellow-subjects beyond the seas. It was important to remember that the majority of the inhabitants of those vast dominions belonged to races and colour different from our own, and that the greatest problems of our Indian and African Empires were bound up with the welfare of the native races of those lands.

Undoubtedly in the past there was much to regret in the influence of England upon uncivilized races, notably with regard to the history of the slave trade, and on this subject Dr. Harford-Battersby had a good deal to say in different parts of the lecture.

Native races were still sometimes regarded much as if they were objects of interest in a museum, and as if their customs, superstitions, and even cruelties ought to be carefully preserved, and any attempt in the direction of civilizing them, or opening up their countries, deprecated. Another more or less general way of treating the dark races was to altogether ignore their rights, to regard them as mere chattels to be used for the benefit of the white man, and to endeavour to deal ruthlessly with their customs and laws, and to introduce in the place of these various ready-made ill-adapted substitutes. Happily, this attitude was no longer common, and an increasing number of people now took a more reasonable view of the position of the native races, and recognised the desirability of stimulating the native's patriotism and cultivating all that was useful in his habits, only endeavouring to eradicate such as were cruel and barbarous.

The great district now known as Nigeria, and which had been secured to Great Britain mainly by the energy of Sir George Taubman-Goldie, was only one of the numerous British possessions in the West Coast of Africa. The native races of the country might be divided roughly into two great classes—those of Lower Nigeria and more particularly of the Niger Delta, to the south; and those of Northern Nigeria, including that territory known as the Hausa States.

The people of Lower Nigeria, in their natural condition, were pagans of a very degraded type. Cannibalism, infanticide, and human sacrifice, had been practised by most, if not all, of them until they had been brought in contact with British influence. They had no central government and there was a great variety of dialects in the district, owing to the fact that the people of the different tribes, and even of different towns, had but little communication with one another.

In Northern Nigeria, the chief races had adopted, somewhat recently, the Mohammedan religion, and many of them were governed by powerful rulers administering considerable territories, and intercourse between one tribe and another was common.

It was not surprising that the inhabitants of the Niger Delta, as a whole, were a barbarous and superstitious people, considering that their villages were situated in the mangrove swamps. At Brass, however, something had been done to improve the condition of the natives, although the work had not always proved successful.

The Ibos, the most important tribe in Lower Nigeria, were found in large numbers on both sides of the river to the north of the Delta. They were typical negroes, but did not, to any large extent, disfigure their faces like many of their neighbours. Several views were shown of this people, notably one illustrating their method of loading a river steamer with barrels of palm-oil—the chief article of commerce with the British. The Ibo towns usually extended over several miles, the houses being built among the trees and divided into villages. The people had not many handicrafts, but industrial work was now being developed among them, at Onitsha, under the guidance of Bishop Tugwell. They possessed an elaborate system of fetish or Ju-ju worship, which was very closely connected with most of their national customs. Except, however, for their degraded superstitions, they were a very fine race and well repaid any trouble that might be taken with them, and there could be no doubt as to the intellectual capacity of the people if they received suitable training.

The country between this savage region of the Delta and the more civilized district of the Southern Soudan was inhabited by a number of pagan tribes, whose habits and customs,

which gradually improved as one ascended the river, were much superior to those of the Ibos. Of these tribes, short descriptions were given of the Igbiras, Igaris, and the Basas. To the north, again, were the Kakandas, dependents of the Nupes. The first time the lecturer had visited Muve, one of the chief Kakanda towns, he had found it absolutely deserted, with the exception of the principal chief and a few of his followers, owing to the people having fled to escape some of the princes of Nupe, who were out slave-raiding. The country round had been in a state of terror and but ill cultivated, the people hardly caring to grow what would, in all probability, be reaped not by themselves but by the slave-raiders. They were, however, expert fishermen, and had long nets with floats similar to those used in Great Britain. As a tribe the Kakandas were pagans, although Mohammedanism had lately gained some ground amongst them. They were an enterprising people, and well worthy of our attention.

The Hausas, Fulahs, Nupes, and Yorubas were the most important of the races of Northern Nigeria, and of these the Hausas were destined, the lecturer considered, to play the most prominent part in the development of that region which was a portion of the great territory known to the natives as the Soudan. It was, however, with the less-known Nupes that he was better acquainted, and of whom he gave the most interesting account.

At the beginning of the nineteenth century the Nupes had been ruled over by a succession of pagan kings, but about the year 1803 several Fulani mallams had, by intrigue, obtained influence at Rabba, and, with the aid of the king of a neighbouring State, gained practical control. The manner in which the Fulahs had managed to get into their hands the chief power of all the great States of the Central Soudan was one of the most remarkable points in the history of this region; for somewhat similar events to those which had taken place in Nupe had occurred in the Hausa States, in most cases previous to the Fulah conquest of Nupe.

The typical Fulah was entirely different in appearance from the negro races of the Soudan, and his skin was as light as that of some of the dark inhabitants of Southern Europe. The Fulahs were essentially a race of herdsmen, and how these quiet shepherds had become the strong rulers of the great Soudan States would probably always remain a mystery. But their striking intellectual and administrative capacity, combined with the fact that they were devoted Mohammedans, had gained for them an influence which was remarkable.

A detailed description was given of a party of missionaries Dr. Harford-Battersby had joined in a journey to Nupe in 1890. They had adopted the native dress—which consisted of loose flowing robes—and endeavoured as far as possible to dissociate themselves from the British authorities. They had at first settled in the town of Lokja, and used to converse freely with the people. The two leaders of the party, however, had soon unfortunately died, and Dr. Harford-Battersby himself had been invalided home. He had, however, during his short stay made two journeys to Bida, the capital of Nupe, a city about two miles long and one-and-a-half wide. The streets were broad and well kept, the inhabitants courtly and well dressed. It contained schools, where the boys were taught to read and write, and a large market, where daily abundant supplies of various goods—hats, sandals, baskets, ink, paper, live stock, brass and leather goods—made in Bida were sold. But in one corner was the slave market, where often 200 men, women and children would be exposed for sale. The problem of slavery was the chief difficulty to be met in dealing with this region. The question, although to a certain extent doubtless a religious one, was in another direction very practical. In the absence of a more satisfactory currency, slaves formed the most convenient way of paying tribute, and the slave raids were maintained largely because Nupe had to pay a heavy tribute to her liege lords. Slaves were, in fact, Central African bank notes; and, if the means of transport could be improved, and the rulers of the Soudan offered a better currency and helped to solve the labour difficulty, there would be some hope of a better state of things. Patience, firmness and tact were needed by all who had to do with these Fulani rulers; and the lecturer made eulogistic reference to the present Governor of Northern Nigeria, Sir Frederick Lugard, who might be trusted to leave no stone unturned to secure the confidence and co-operation of these powerful rulers.

The position of the Hausas was unique among the natives of Central Africa. Their language was used in commerce, and for administration and religious purposes over a very wide area. Their literature was of the greatest importance, and their mallams men of marked ability. Their towns were surrounded by high walls, and the study of their language and customs was considered to be of such great importance that a special society, the Hausa Association, had been formed to make them better known.

The Yorubas had probably benefited more than any other West African race from their contact with Europeans, and some of the most intellectual members of the negro races had come from this country; but, in the lecturer's opinion, the Hausas were distinctly the superior race, having a remarkable civilization of their own, a well-formed literature, a good system of education, great powers as travellers, and above all made good soldiers.

He hoped that every effort would be made to help forward the education of the native races, particularly in industrial pursuits; that great care would be taken not to denationalise the people, but to encourage them to adopt the best features of European civilization without throwing aside certain of their habits, which, in many cases, were far better adapted to the country than European ones. He laid great stress upon the importance of the question of language study, and, above all, hoped that religious liberty would be granted so far as was consistent with morality, and strongly deprecated the tendency, which existed in some influential quarters, of practically encouraging Mohammedanism under the delusion that it was more suited to the people of the country than Christianity. He considered that Mohammedanism, as a religion, should have fair play, but religious toleration had been one of the proudest boasts of the British nation and he hoped that it might always continue to be so.

The various points of the lecture were admirably illustrated by a selection of lantern views, and the chairman, in proposing the vote of thanks, said that the lecture could not have failed to have given those who had listened to it a deeper interest in all questions bearing upon the administration of the vast territory of Nigeria.

"THE WORKS OF A. N. MAIKOV."

By MR. F. P. MARCHANT.

(ANGLO-RUSSIAN LITERARY SOCIETY.)

At the last meeting of the Society on February 4, Mr. E. A. Cazalet, president, in the chair, a paper was read by Mr. F. P. Marchant entitled "The Works of Apollon N. Maikov."

In his introductory remarks Mr. Cazalet dwelt upon the able and energetic way in which Mr. Marchant had always helped on the work of the Society. He had read interesting papers on Russian authors with whose works he had intimate acquaintance, and almost every number of the Society's *Journal of Proceedings* contained some of his translations of Russian poems and Reviews of books presented to the Society.

While admitting at the outset that the Russian poet Maikov did not command the eminence and influence to which Pushkin, Lermontoff, and even Nekrarsov, had attained, Mr. Marchant expressed his conviction that all who had not as yet read A. N. Maikov's works would be amply repaid by a study of this writer.

Mr. Marchant briefly enumerated the chief incidents of the poet's life. Born in 1821, of a noble and ancient family, he was brought up amidst congenial surroundings at his father's estate near the Troitsko Sergievskaya Monastery. He began his career as a chinovnik in the Ministry of Finance and ended it as an Imperial Censor. The lecturer then proceeded to

a detailed examination of Maikov's work, beginning with a very large collection of short graceful poems dealing with an immense variety of subjects. Some of these headed, *From the Eastern World*, recalled Byron's Hebrew Melodies. A philosophical poem, *The Spirit of the Age*, contained some profound reflections and the idea of the "Zeit-geist" was wonderfully well brought out. Among the series headed *Art* was a charming eulogy of Glinka's songs. The well-known ancient fragment *Song of the Expedition of Igor*, a subject of keen dispute, occupied Maikov for four years, and he produced a lengthy essay and rhythmical version of the poem. But Maikov's finest work was probably the *Two Worlds*, a tragedy showing the struggle of the decaying Greco-Roman world with the new world of Christianity, introducing fresh principles into the lives of men and into their relations to each other. Besides all his original poems Maikov had left a number of translations of works of Longfellow, Hafiz, Sappho, and especially of Heine, for whose writings he had a great admiration.

In conclusion Mr. Marchant said that he did not claim to have given an exhaustive account of Maikov's works, but he hoped that he had said enough to show that their writer was a glory to the literature of his country. No other Russian writer had evinced such a grasp of the spirit of the ancient world and at the same time so entirely sympathised with modern progress. His tone was delicate and refined, his verse musical and artistic. His philosophy and morality, drawn from a wide experience of humanity, and letters breathed a noble and lofty spirit. In short, none could read Maikov without feeling the better for contact with this pure-minded, cultured Russian artist and singer.

Captain Hussey Walsh made some interesting remarks, in the course of which he compared some of Maikov's work to Pushkin's. He also drew attention to the fact that whereas the lives of most Russian poets, Pushkin, Lermontoff, Nekrarsov, etc. were full of trouble and anxieties and were spent in a continual struggle to make both ends meet, Maikov's circumstances seemed to have been easy and comfortable from first to last.

Mr. Kinloch could not agree with Captain Hussey Walsh in his comparison of Maikov to Pushkin; the genius, spontaneity and much of the national spirit of Pushkin were entirely wanting in Maikov's poetry.

Mr. Cazalet, in bringing the meeting to a close, after a hearty vote of thanks to the lecturer, said that he had met Maikov, who was then about forty, at St. Petersburg in the sixties. The President read aloud a translation by Doctor John Pollen of Maikov's poem on the Liberation of the Serfs, which it had been the speaker's privilege to hear read by the Russian poet himself.

PROCEEDINGS OF INSTITUTIONS.

THE ROYAL AGRICULTURAL SOCIETY OF ENGLAND.

At the monthly Council held on the 5th ult. the EARL OF COVENTRY (Vice-President) occupied the chair; 37 new members were elected. Mr. Bowen-Jones, in presenting the report of the Chemical and Woburn Committee, reminded members of the Council that their attention had been drawn to the question, which was now under the consideration of a committee appointed by the Privy Council, of the operation of the Pharmacy Act of 1868, which at present regulated the sale of poisons, especially in its relations to the very numerous articles now used in agricultural and horticultural operations as insecticides, sheep-dips and the like, which contained poisonous ingredients. The Act of 1868 made it illegal under penalties to sell or keep open shop for retailing certain poisons by any other person than a duly qualified chemist. The poisons that could not be sold otherwise were enumerated in Schedule A of the Act, and they could be added to from time to time under Section 2 of that Act by a resolution of the Pharmaceutical Society declaring other articles to be poisons under the Act, provided that resolutions were approved by the Privy Council. The poisons named in Schedule A of the Act of 1868 that were used generally in preparations or compounds for agricultural and horticultural purposes were arsenic and its preparations, corrosive sublimate, strychnine, and all poisonous vegetable alkaloids and their salts. Since the passing of the Act, carbolic acid had been added under Section 2, but through the opposition of the agricultural interest, this substance was excepted "in any preparations used for agricultural and horticultural purposes." The poisons referred to in the original Schedule A of the Act entered largely into the composition of insecticides, vermin-killers, dressings for live stock, sheep-dips, sheep-fly powders, fruit tree- and hop-sprays, and disinfectants, and others might still be added from time to time under Section 2, such as butter of antimony, sulphuric acid, and sulphate of copper, which were extensively employed in agricultural and horticultural operations. The ordinary layman's construction of the Act of 1868 would be that it never was intended to apply to such compounds as he had named, used for the purposes stated. But the action of the Pharmaceutical Society two or three years ago had rather set aside such a contention. Probably the considerable increase in the use of these articles in connection with agricultural and horticultural work which had taken place in recent years might have been the exciting cause for their action, but, be this as it might, some cases were—at the instance of the Council of the Pharmaceutical Society—brought before the Courts, and penalties were claimed against vendors (who were not chemists) of preparations containing arsenic, for weed-killing, and of nicotine used as an insecticide. It appeared therefore, that pharmaceutical chemists had to some extent obtained a monopoly, and there were signs of a desire to extend it. The Poisons Committee had been appointed to enquire and report the alterations which they deemed expedient in Schedule A of the Pharmacy Act of 1868, and to consider whether a third sub-division might not properly be added to the schedule containing substances which, whether sold by pharmaceutical chemists or not, should be labelled or otherwise distinguished. The Chemical Committee were of opinion that it would be inconvenient to farmers and others living in rural districts to be compelled to purchase the articles referred to at no other place than a druggist's shop; that the effect of such action would be to create a monopoly, which would much enhance the price of the commodities purchased to the detriment of farmers and gardeners; and that such action would be strongly resented and resisted by agriculturists generally.

With regard, therefore, to the first subject of reference to the Poisons Committee, "To report the alterations which they deem expedient in Schedule A of the Pharmacy Act of 1868," the Chemical Committee were of the opinion that it was necessary (a) That Schedule A of the Act of 1868 should be more strictly defined than at present (for example, the first item, "Arsenic and its preparations" might be held at present to cover sheep-dips, weed-killers, Paris green—for fruit trees—arsenical soaps, and other articles used in agricultural operations, which were totally unconnected with pharmacy, and were not required to be dispensed, being already prepared in the form in which they are used by the public). Such articles should either be excluded from Schedule A or otherwise excepted from the provisions of Section 15 of the Act. (b) That the power at present given under Section 2 of the Act to the Council of the Pharmaceutical Society to declare by resolution that "any article in such resolution named ought to be deemed a poison within the meaning of the Act of 1868," should, as regards agricultural and horticultural articles, be only exercised with the previous approval of the Board of Agriculture.

With regard to the second reference to the Poisons Committee, "to consider whether a third sub-division might not be added to the schedule, containing substances which, whether sold by pharmaceutical chemists or not, should be labelled or otherwise distinguished," the Chemical Committee thought that it would be reasonable if the sale of what, for convenience, might be called "agricultural and horticultural poisons" should be allowed, provided the article were sold in the condition in which it was received from the manufacturers, the packet, bottle, or other receptacle being kept intact and unopened, and marked outside with an indication of its contents, and of the poisonous nature of the substance. The specific articles

to be included in this third sub-division should be clearly stated in the schedule. In the case of the more virulently poisonous of such preparations, the same precautions as defined in Section 17 of the Act of 1868, as to a register of sales, etc., might also be prescribed; but otherwise, there should be no restrictions or monopoly in the sale of poisonous substances used in agricultural or horticultural operations. He, therefore, proposed to attend the meeting of the Poisons Committee, and give evidence on the lines he had explained to the Council.

The Hon. Cecil Parker presented a report from Professor McFadyean, stating that during the four weeks ending January 25, there had been 67 outbreaks of anthrax, with 100 animals attacked. This was a rather serious increase as compared with the same period of last year, when the outbreaks were 44 and the animals attacked 64. During the same period there had been 229 cases of glanders, as against 209 in the corresponding four weeks of 1901. Swine fever continued to spread, the outbreaks for the last four weeks having been 152, an increase of 20 as compared with the corresponding period of last year. The country continued to be free from foot-and-mouth disease. The miscellaneous researches at the Royal Veterinary College included several cases of poisoning of cattle with yew leaves, the dangerous properties of which still appeared to be unknown to many farmers. A letter had been received from the Devon County Council, forwarding the following resolution and inviting the co-operation of the Society in bringing the subject to the notice of the Government:—"That, in view of the national importance of an adequate supply of sound horses, this Council is of opinion that legislation should be introduced empowering county councils to prohibit the use for hire within their districts of stallions suffering from hereditary disease."

The chairman observed that the question was one of considerable importance. He thought it would be sufficient on the present occasion if a reply were sent to the Devon County Council stating that the Council of the Society were fully conscious of the national importance of an adequate supply of sound horses, and that by their rules, under which breeding animals in the classes for horses at the Society's shows were required to be certified as free from hereditary disease before receiving prizes, they were doing all they could to encourage the breeding of sound horses. A reply in this sense was agreed to, and the report of the Veterinary Committee was adopted.

Lord Moreton, from the Education Committee, reported that the examination for the national diploma in agriculture for the year 1902, would be held at the Yorkshire College, Leeds, on May 5 and the following days, and that the regulations for the examination for the national diploma in dairying next September included a revised syllabus for chemistry and bacteriology.

The Council adjourned until Wednesday, the 5th inst.

THE ROYAL STATISTICAL SOCIETY.

At a meeting of the Society, held on the 18th ult., Dr. GINSBURG read a paper by Mr. F. J. ATKINSON, giving "A statistical review of the income and wealth of British India." After referring to a remark made by Lord Curzon in a speech on the Indian Budget for 1901-02 to the effect that there had been an increase in the mean income of the inhabitants of India between 1880 and 1898 of no less than 11 per cent., and to a statement made by Mr. W. Digby, who criticized Lord Curzon's figures and argued that there had been a diminution of average income of no less than 30 per cent. between the years 1890 and 1900, Mr. Atkinson discussed the question with the view of finding out the true facts. He said that this could not be done with any great exactitude, because there were no statistics of cultivation in some parts of India before 1892-93 and there were difficulties in regard to the estimated yields. He divided the population, for the purposes of his survey, into three classes—agricultural, non-agricultural, and those of sufficient or ample means. Having examined the position of the various sections included in the first class, Mr. Atkinson came to the conclusion that the agricultural income of British India increased from Rs.26'4 per head in 1875 to Rs.35'9 per head in 1895, this being an increase of 39'8 per cent.

A similar enquiry, the results of which were set forth in great detail, convinced him that the non-agricultural income went up from Rs.28'8 per head in 1875 to Rs.34'1 in 1895, or an increase of 18'4 per cent. As these two classes of persons comprised 97'6 per cent. of the entire population, it might be taken that the average annual income of this great mass of people rose from Rs.27'3 in 1875 to Rs.35'2 in 1895, an increase of 28'9 per cent.

In examining the incomes of the third section, Mr. Atkinson gave reasons for doubting the trustworthiness of the income-tax returns, which he was unable to accept as a full disclosure of the position of the people, and he made his calculations on a more extended basis. In the result he put the income of this class as a whole at 74 crores of rupees in 1875 and at 113½ crores in 1895. Summarizing the three sections, he arrived at a conclusion that during the 20 years under review the average income rose 29'5 per cent.—that is to say, from Rs.30'5 per head to Rs.39'5 per head. Alluding to the wealth of British India, he discussed the monetary situation and the amount of hoards and ornaments which the people had put by, and gave an interesting historical survey for the purpose of forming an estimate of the stock of precious metals which the various conquerors had left in the country after successive raids, and of the amount which from time to time had been imported and allowed to remain in the hands of the people. He reckoned that the amount of the totals of the two stores was—in currency, in 1876, 146 crores of rupees, rising to 223 crores in 1900; and under the second head (hoards and ornaments) six crores in 1875, increasing to 8½ crores in 1895. In one of the numerous tables supplementary to the paper there was set out a balance-sheet of India which seemed to show that the actual capital wealth, as distinguished from income, per head of the population, increased from Rs.703'8 in 1875 to Rs.986'6 in 1895, or no less than 40'2 per cent. In conclusion, he gave figures to show the great rise in capital investments of recent years. In 1875 the amount was Rs.20,13,70,000; in 1894, Rs.53,06,51,000; and in 1899, Rs.76,22,69,000. Mr. Atkinson described this increase as a satisfactory indication that the rise in the exchange value of the rupee had stimulated the supply of capital, the greater portion of which came from England.

THE ROYAL GEOGRAPHICAL SOCIETY.

At a meeting of the Royal Geographical Society, held on the 10th ult., the Rev. THOMAS LEWIS read a paper on "The Ancient Kingdom of Congo: Its Present Position and Possibilities." Mr. G. S. MACKENZIE presided in the absence of Sir CLEMENTS R. MARKHAM, the president.

Mr. Lewis, in the course of his paper, remarked that he had laboured in Africa for 19 years, 15 of which he had spent in Portuguese Congo. After referring to the past history of Congo, he alluded to present conditions and said that the native was capable of thinking and reasoning, and therefore could be trained to take a prominent part in the development of his country. Hitherto, both the country and its people had been sadly neglected, and at this critical time in the history of Africa he wished to put in a plea for a fuller recognition of the native element in dealing with African questions. They could not manage Africa apart from the African, and the future of the vast continent, from the Cape to Cairo, would depend, in a large measure, on how they dealt with the natives. He viewed with the deepest concern and distrust the present fever-heat rush of civilization into the heart of Africa. It was not a natural growth, and it did not represent any real development of the native character.

The progress of the country and the advancement of free institutions depended wholly upon the character of the people and upon a long and patient course of training. From that

point of view it was not altogether a disadvantage that the country was in the hands of the least ambitious and self-assertive of European Governments. The very weakness and poverty of the Portuguese had its advantages, for the small military force at their command made them wary of entering upon mischievous punitive expeditions. An important move, in his opinion, would be to protect the principal caravan routes from the interior to the coast stations. Those routes were often closed on account of native disputes and fightings. On such occasions unwary caravans were attacked and plundered of all goods and produce. Even in time of peace it was appalling the amount of blackmailing that went on.

The transport problem was a very serious one, and a final solution of the difficulty would not be arrived at until railways had been constructed from the coast to the chief markets in the interior. The most serious outlook for the future was that the whole district, rich in fertile valleys and productive highlands, was lying idle without any attempt to make use of it. He suggested that the establishment of a school of agriculture and a botanical garden would be a step in the direction of averting the total ruin which threatened in the province. He did not know of a single commodity of commercial value which was produced in the Congo and Lombo countries except what the natives consumed themselves, and yet the soil would grow almost everything.

The future of the ancient kingdom of Congo did not depend on the discovery of gold or copper within its borders, but on the more important discovery of the native himself—the discovery of all that was best in him and all that was noble. For generations he had been looked upon as "a slave," "a piece," and "a hand," but not until the man in him was found and recognized could there be any real progress made in the development of Africa.

COMMERCIAL INTELLIGENCE DEPARTMENT.

CORRESPONDENCE AND ENQUIRIES.

The following are given as specimens of some of the enquiries which have been addressed to, and satisfactorily answered by, the Institute during the past month (February).

* * All communications must be authenticated by the name and address of the writer. Enquiries which would involve special applications or expense will be a matter of arrangement with the correspondent.

- D. & Co., London.—Sugar refiners in Austria.
- H. D., Huddersfield.—Makers of fan folding frames for paper.
- F. W. B., Dulwich.—Cultivation of sponges.
- W. W., London.—Salt trade in the East.
- A. & S., Leeds.—Woods suitable for the construction of an organ for the West Indies.
- B. B. & Co., Seychelles.—Manufacture of fish oils.
- N. V., Norway.—Import duties on goloshes into various countries.
- H. C., Tasmania.—Preparation of anchovies.

REQUIREMENTS REGISTRY.

In order to provide correspondents with an opportunity of making known special "wants" or "needs" in the British Colonies, India, and Foreign Countries, space will be regularly devoted to the publication of approved notices in the IMPERIAL INSTITUTE JOURNAL. Notices, as a rule, should not exceed 25 words in length, for which a charge of 2s. 6d. will be made for each insertion. Special arrangements can be made for longer notices.

SPECIMENS OF FOREIGN AND COLONIAL WOODS desired. Purchase or exchange. Names and localities must be well authenticated. Address—HERBERT STONE, BRACEBRIDGE-STREET, BIRMINGHAM.

THE CURATOR OF THE CANADIAN SECTION OF THE IMPERIAL INSTITUTE is prepared to furnish information about Canadian Trade and to supply names of importers, manufacturers, shippers, etc.

The following trade enquiries have been received at the Canadian Section of the Imperial Institute, from the Curator of which Section further particulars may be obtained:—

- Home Enquiries.**—A firm of manufacturers wishes to hear from Canadian firms who can supply round wood of a tough character, ½ in., ¾ in., 1 in., 1½ in., 2 in., 2½ in., 3 in., 4 in., 5 in., 6 in., 8 in., 10 in., 12 in., 14 in., 16 in., 18 in., 20 in., 22 in., 24 in., 26 in., 28 in., 30 in., 32 in., 34 in., 36 in., 38 in., 40 in., 42 in., 44 in., 46 in., 48 in., 50 in., 52 in., 54 in., 56 in., 58 in., 60 in., 62 in., 64 in., 66 in., 68 in., 70 in., 72 in., 74 in., 76 in., 78 in., 80 in., 82 in., 84 in., 86 in., 88 in., 90 in., 92 in., 94 in., 96 in., 98 in., 100 in., 102 in., 104 in., 106 in., 108 in., 110 in., 112 in., 114 in., 116 in., 118 in., 120 in., 122 in., 124 in., 126 in., 128 in., 130 in., 132 in., 134 in., 136 in., 138 in., 140 in., 142 in., 144 in., 146 in., 148 in., 150 in., 152 in., 154 in., 156 in., 158 in., 160 in., 162 in., 164 in., 166 in., 168 in., 170 in., 172 in., 174 in., 176 in., 178 in., 180 in., 182 in., 184 in., 186 in., 188 in., 190 in., 192 in., 194 in., 196 in., 198 in., 200 in., 202 in., 204 in., 206 in., 208 in., 210 in., 212 in., 214 in., 216 in., 218 in., 220 in., 222 in., 224 in., 226 in., 228 in., 230 in., 232 in., 234 in., 236 in., 238 in., 240 in., 242 in., 244 in., 246 in., 248 in., 250 in., 252 in., 254 in., 256 in., 258 in., 260 in., 262 in., 264 in., 266 in., 268 in., 270 in., 272 in., 274 in., 276 in., 278 in., 280 in., 282 in., 284 in., 286 in., 288 in., 290 in., 292 in., 294 in., 296 in., 298 in., 300 in., 302 in., 304 in., 306 in., 308 in., 310 in., 312 in., 314 in., 316 in., 318 in., 320 in., 322 in., 324 in., 326 in., 328 in., 330 in., 332 in., 334 in., 336 in., 338 in., 340 in., 342 in., 344 in., 346 in., 348 in., 350 in., 352 in., 354 in., 356 in., 358 in., 360 in., 362 in., 364 in., 366 in., 368 in., 370 in., 372 in., 374 in., 376 in., 378 in., 380 in., 382 in., 384 in., 386 in., 388 in., 390 in., 392 in., 394 in., 396 in., 398 in., 400 in., 402 in., 404 in., 406 in., 408 in., 410 in., 412 in., 414 in., 416 in., 418 in., 420 in., 422 in., 424 in., 426 in., 428 in., 430 in., 432 in., 434 in., 436 in., 438 in., 440 in., 442 in., 444 in., 446 in., 448 in., 450 in., 452 in., 454 in., 456 in., 458 in., 460 in., 462 in., 464 in., 466 in., 468 in., 470 in., 472 in., 474 in., 476 in., 478 in., 480 in., 482 in., 484 in., 486 in., 488 in., 490 in., 492 in., 494 in., 496 in., 498 in., 500 in., 502 in., 504 in., 506 in., 508 in., 510 in., 512 in., 514 in., 516 in., 518 in., 520 in., 522 in., 524 in., 526 in., 528 in., 530 in., 532 in., 534 in., 536 in., 538 in., 540 in., 542 in., 544 in., 546 in., 548 in., 550 in., 552 in., 554 in., 556 in., 558 in., 560 in., 562 in., 564 in., 566 in., 568 in., 570 in., 572 in., 574 in., 576 in., 578 in., 580 in., 582 in., 584 in., 586 in., 588 in., 590 in., 592 in., 594 in., 596 in., 598 in., 600 in., 602 in., 604 in., 606 in., 608 in., 610 in., 612 in., 614 in., 616 in., 618 in., 620 in., 622 in., 624 in., 626 in., 628 in., 630 in., 632 in., 634 in., 636 in., 638 in., 640 in., 642 in., 644 in., 646 in., 648 in., 650 in., 652 in., 654 in., 656 in., 658 in., 660 in., 662 in., 664 in., 666 in., 668 in., 670 in., 672 in., 674 in., 676 in., 678 in., 680 in., 682 in., 684 in., 686 in., 688 in., 690 in., 692 in., 694 in., 696 in., 698 in., 700 in., 702 in., 704 in., 706 in., 708 in., 710 in., 712 in., 714 in., 716 in., 718 in., 720 in., 722 in., 724 in., 726 in., 728 in., 730 in., 732 in., 734 in., 736 in., 738 in., 740 in., 742 in., 744 in., 746 in., 748 in., 750 in., 752 in., 754 in., 756 in., 758 in., 760 in., 762 in., 764 in., 766 in., 768 in., 770 in., 772 in., 774 in., 776 in., 778 in., 780 in., 782 in., 784 in., 786 in., 788 in., 790 in., 792 in., 794 in., 796 in., 798 in., 800 in., 802 in., 804 in., 806 in., 808 in., 810 in., 812 in., 814 in., 816 in., 818 in., 820 in., 822 in., 824 in., 826 in., 828 in., 830 in., 832 in., 834 in., 836 in., 838 in., 840 in., 842 in., 844 in., 846 in., 848 in., 850 in., 852 in., 854 in., 856 in., 858 in., 860 in., 862 in., 864 in., 866 in., 868 in., 870 in., 872 in., 874 in., 876 in., 878 in., 880 in., 882 in., 884 in., 886 in., 888 in., 890 in., 892 in., 894 in., 896 in., 898 in., 900 in., 902 in., 904 in., 906 in., 908 in., 910 in., 912 in., 914 in., 916 in., 918 in., 920 in., 922 in., 924 in., 926 in., 928 in., 930 in., 932 in., 934 in., 936 in., 938 in., 940 in., 942 in., 944 in., 946 in., 948 in., 950 in., 952 in., 954 in., 956 in., 958 in., 960 in., 962 in., 964 in., 966 in., 968 in., 970 in., 972 in., 974 in., 976 in., 978 in., 980 in., 982 in., 984 in., 986 in., 988 in., 990 in., 992 in., 994 in., 996 in., 998 in., 1000 in., 1002 in., 1004 in., 1006 in., 1008 in., 1010 in., 1012 in., 1014 in., 1016 in., 1018 in., 1020 in., 1022 in., 1024 in., 1026 in., 1028 in., 1030 in., 1032 in., 1034 in., 1036 in., 1038 in., 1040 in., 1042 in., 1044 in., 1046 in., 1048 in., 1050 in., 1052 in., 1054 in., 1056 in., 1058 in., 1060 in., 1062 in., 1064 in., 1066 in., 1068 in., 1070 in., 1072 in., 1074 in., 1076 in., 1078 in., 1080 in., 1082 in., 1084 in., 1086 in., 1088 in., 1090 in., 1092 in., 1094 in., 1096 in., 1098 in., 1100 in., 1102 in., 1104 in., 1106 in., 1108 in., 1110 in., 1112 in., 1114 in., 1116 in., 1118 in., 1120 in., 1122 in., 1124 in., 1126 in., 1128 in., 1130 in., 1132 in., 1134 in., 1136 in., 1138 in., 1140 in., 1142 in., 1144 in., 1146 in., 1148 in., 1150 in., 1152 in., 1154 in., 1156 in., 1158 in., 1160 in., 1162 in., 1164 in., 1166 in., 1168 in., 1170 in., 1172 in., 1174 in., 1176 in., 1178 in., 1180 in., 1182 in., 1184 in., 1186 in., 1188 in., 1190 in., 1192 in., 1194 in., 1196 in., 1198 in., 1200 in., 1202 in., 1204 in., 1206 in., 1208 in., 1210 in., 1212 in., 1214 in., 1216 in., 1218 in., 1220 in., 1222 in., 1224 in., 1226 in., 1228 in., 1230 in., 1232 in., 1234 in., 1236 in., 1238 in., 1240 in., 1242 in., 1244 in., 1246 in., 1248 in., 1250 in., 1252 in., 1254 in., 1256 in., 1258 in., 1260 in., 1262 in., 1264 in., 1266 in., 1268 in., 1270 in., 1272 in., 1274 in., 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1876 in., 1878 in., 1880 in., 1882 in., 1884 in., 1886 in., 1888 in., 1890 in., 1892 in., 1894 in., 1896 in., 1898 in., 1900 in., 1902 in., 1904 in., 1906 in., 1908 in., 1910 in., 1912 in., 1914 in., 1916 in., 1918 in., 1920 in., 1922 in., 1924 in., 1926 in., 1928 in., 1930 in., 1932 in., 1934 in., 1936 in., 1938 in., 1940 in., 1942 in., 1944 in., 1946 in., 1948 in., 1950 in., 1952 in., 1954 in., 1956 in., 1958 in., 1960 in., 1962 in., 1964 in., 1966 in., 1968 in., 1970 in., 1972 in., 1974 in., 1976 in., 1978 in., 1980 in., 1982 in., 1984 in., 1986 in., 1988 in., 1990 in., 1992 in., 1994 in., 1996 in., 1998 in., 2000 in., 2002 in., 2004 in., 2006 in., 2008 in., 2010 in., 2012 in., 2014 in., 2016 in., 2018 in., 2020 in., 2022 in., 2024 in., 2026 in., 2028 in., 2030 in., 2032 in., 2034 in., 2036 in., 2038 in., 2040 in., 2042 in., 2044 in., 2046 in., 2048 in., 2050 in., 2052 in., 2054 in., 2056 in., 2058 in., 2060 in., 2062 in., 2064 in., 2066 in., 2068 in., 2070 in., 2072 in., 2074 in., 2076 in., 2078 in., 2080 in., 2082 in., 2084 in., 2086 in., 2088 in., 2090 in., 2092 in., 2094 in., 2096 in., 2098 in., 2100 in., 2102 in., 2104 in., 2106 in., 2108 in., 2110 in., 2112 in., 2114 in., 2116 in., 2118 in., 2120 in., 2122 in., 2124 in., 2126 in., 2128 in., 2130 in., 2132 in., 2134 in., 2136 in., 2138 in., 2140 in., 2142 in., 2144 in., 2146 in., 2148 in., 2150 in., 2152 in., 2154 in., 2156 in., 2158 in., 2160 in., 2162 in., 2164 in., 2166 in., 2168 in., 2170 in., 2172 in., 2174 in., 2176 in., 2178 in., 2180 in., 2182 in., 2184 in., 2186 in., 2188 in., 2190 in., 2192 in., 2194 in., 2196 in., 2198 in., 2200 in., 2202 in., 2204 in., 2206 in., 2208 in., 2210 in., 2212 in., 2214 in., 2216 in., 2218 in., 2220 in., 2222 in., 2224 in., 2226 in., 2228 in., 2230 in., 2232 in., 2234 in., 2236 in., 2238 in., 2240 in., 2242 in., 2244 in., 2246 in., 2248 in., 2250 in., 2252 in., 2254 in., 2256 in., 2258 in., 2260 in., 2262 in., 2264 in., 2266 in., 2268 in., 2270 in., 2272 in., 2274 in., 2276 in., 2278 in., 2280 in., 2282 in., 2284 in., 2286 in., 2288 in., 2290 in., 2292 in., 2294 in., 2296 in., 2298 in., 2300 in., 2302 in., 2304 in., 2306 in., 2308 in., 2310 in., 2312 in., 2314 in., 2316 in., 2318 in., 2320 in., 2322 in., 2324 in., 2326 in., 2328 in., 2330 in., 2332 in., 2334 in., 2336 in., 2338 in., 2340 in., 2342 in., 2344 in., 2346 in., 2348 in., 2350 in., 2352 in., 2354 in., 2356 in., 2358 in., 2360 in., 2362 in., 2364 in., 2366 in., 2368 in., 2370 in., 2372 in., 2374 in., 2376 in., 2378 in., 2380 in., 2382 in., 2384 in., 2386 in., 2388 in., 2390 in., 2392 in., 2394 in., 2396 in., 2398 in., 2400 in., 2402 in., 2404 in., 2406 in., 2408 in., 2410 in., 2412 in., 2414 in., 2416 in., 2418 in., 2420 in., 2422 in., 2424 in., 2426 in., 2428 in., 2430 in., 2432 in., 2434 in., 2436 in., 2438 in., 2440 in., 2442 in., 2444 in., 2446 in., 2448 in., 2450 in., 2452 in., 2454 in., 2456 in., 2458 in., 2460 in., 2462 in., 2464 in., 2466 in., 2468 in., 2470 in., 2472 in., 2474 in., 2476 in., 2478 in., 2480 in., 2482 in., 2484 in., 2486 in., 2488 in., 2490 in., 2492 in., 2494 in., 2496 in., 2498 in., 2500 in., 2502 in., 2504 in., 2506 in., 2508 in., 2510 in., 2512 in., 2514 in., 2516 in., 2518 in., 2520 in., 2522 in., 2524 in., 2526 in., 2528 in., 2530 in., 2532 in., 2534 in., 2536 in., 2538 in., 2540 in., 2542 in., 2544 in., 2546 in., 2548 in., 2550 in., 2552 in., 2554 in., 2556 in., 2558 in., 2560 in., 2562 in., 2564 in., 2566 in

CHARTS AND PLANS.

Published by the Hydrographic Department, Admiralty, during November and December, 1901; J. D. PORTER, Agent, 145, Minories, London, E.C.

No.	New Charts.
3207	Northern entrance to Achill sound, including the approaches to Tonregée.
3215	France, west coast:—Goulet de Fromantine to Pointe de St. Gildas.
3166	West Indies:—Puerto Rico island. Jobos harbour.
3188	Central America:—Gulf of Mexico. Sabine pass.
1284	South America, east coast:—Cape Dos Bahias to Staten island.
3226	South America, east coast:—Port Santa Cruz.
616	Africa, west coast:—Sierra Leone river and anchorage.
3211	Africa, east coast:—Zanzibar island:—Zanzibar harbour.
1988	China, east coast:—Approach to Samsa inlet.
3184	China: Plans in the Yang Tse Kiang:—I-tu reach.
3216	Japan:—Plans on the east coast of Nippon Island:—Nakanosaku. Hakuchi. Naka Minato. Hirakata wan.
3186	Australia, north-west coast:—Mary Ann passage and approaches.
3187	Australia, west coast:—Mangrove islands to north-west cape.
3221	Plans on the south coast of Australia:—Duke of Orleans bay. Goose island bay.
2662	Celebes: Ports in Makassar strait. Plans added:—Lingadang road and Belonlioh bay. Pambauwang road. Chinrana and Binanga bays.

Charts that have received additions or corrections too large to be conveniently inserted by hand, and in most cases other than those referred to in the Admiralty Notices to Mariners.

No.	No.
1991	England, south coast:—Folkestone harbour.
1951	England, west coast:—Liverpool bay.
1975	England, east coast. River Thames:—Kentish Knock to the West Swin.
2693	England, east coast:—Orwell and Stour rivers.
2845	England, Channel islands: Alderney harbour.
1297	Norway:—Lepsö to Ona.
1298	Norway:—Approaches to Molde.
1972	Norway:—Approaches to Trondhjem, eastern sheet.
1343	France, west coast:—Adour river from the entrance to Bayonne.
1422	North America:—Labrador.
327	Lake Huron:—Georgian Bay.
2908	Africa, south coast:—Port Natal entrance.
1003	Africa, east coast:—Pungue river, Beira harbour.
759a	Madagascar:—Cape St. Andrew to Beavato island.
143	Red Sea:—Jebel Teir to Perim island.
1413	Malacca strait:—Rhio strait.
1789	Malacca strait:—Channels between Sumatra and Linga.
941b	Eastern archipelago:—Western portion.
942a	Eastern archipelago:—Eastern portion.
3044	Celebes:—Ujong Jonga to Ujong Kassi.
2636	Philippine islands:—Strait of Makassar, north part.
2391	Philippine islands:—Port Ilo Ilo.
975	Philippine islands:—Port Kavite.
2660b	China sea:—Southern portion.
2357	China, north coast:—Ching Wang Tao road.
1708	Australia, Sheet II:—Albert river.
917	Australia, west coast:—Harbours and anchorages on the west coast.
1700	Australia, west coast:—Freemantle harbour and Gage roads.
1059	Australia, south coast:—Doubtful island bay to the head of the Great Australian bight.
2984	Australia, south coast:—Esperance bay.

THE FROZEN MEAT TRADE OF 1901.

In their review of the Frozen Meat Trade of 1901, Messrs. Weddel and Co. state that, speaking generally, it must be admitted that it was a year of unduly high expectations, which ended in disappointment to both colonial and home dealers. All the disappointment and loss arose through rates being paid in the Colonies higher than at any time were warranted by the position of the market at this end, and not through any unusually low range of values prevailing at Smithfield, where prices during 1901 were well up to the average, for most classes of frozen meat. The drought in Australia caused growers there to demand prices for their limited surpluses which left no margin for exporters to work upon. In New Zealand the opinion was generally entertained that stocks in that Colony were shorter than was actually the case, the light shipments made during the earlier part of the year lending colour to the idea. Freezing companies and speculators in the colonial markets paid extreme prices for both mutton and lamb, and found difficulty in reselling to British operators without at once facing a loss. In many instances, rather than accept that position these highly priced purchases were sent on to London for sale on consignment, but with unfortunate results.

The total quantities imported during the year from both Australia and New Zealand were by no means excessive; but the Australian export was most erratic, and the arrival of New Zealand shipments was not well timed, receipts of mutton and lamb in the second half of the year being much too heavy for the demand at that season. Supplies from the River Plate increased in volume steadily throughout the year, so that the belated shipments of mutton from New Zealand had to face the further disability of competing with heavy arrivals from the Argentine Republic.

The war in South Africa, again, had some influence upon the course of the market. Large quantities of beef and mutton from Australia were delivered at the Cape, instead of being brought on to London, as would probably have been the case under ordinary circumstances; and to that extent the home market was relieved. On the other hand, the general slackening of trade throughout the country, which was so noticeable during the latter half of the year, was doubtless due, to some extent, to the prolongation of the war.

The Board of Trade returns prove that the frozen meat trade in 1901 was of greater magnitude than in any previous year, the weight of frozen mutton, lamb, and beef imported from all resources being 226,095 tons, as against 209,231 tons in 1900, and 201,833 tons in 1899. Over and above the heavy increase in frozen meats, the returns show that the import of American chilled beef was heavier than it had ever been before, the total receipt being no less than 159,014 tons.

Seldom was there any excessive supply of home-fed meats on the market, and the prices of English beef and mutton were maintained fairly steady throughout the year. In September there was rather a heavy run of Scotch lambs on the market, and prices at that time fell to a low ebb; but this was quite exceptional, and neither home-fed nor Continental supplies, at any time during 1901, had much direct influence upon the course of values for frozen meats: certainly the market fluctuations of the two classes of meat appeared to be, to a very great extent, independent of each other. Extended experience only confirms the views set forth in these columns in 1896 that the importation of frozen meat has practically created an entirely new set of meat consumers in this country, largely, of course, amongst the working classes, who are in consequence very much better fed than can have been the case fifteen or twenty years ago.

With regard to the general outlook, the report says that for ten years past the flocks and herds of the United Kingdom have remained almost stationary, while the population has increased by 3,720,000 persons. The utmost that can be claimed for the home supply of beef and mutton is that it has maintained its volume in recent years, but it does not nearly keep pace with the growth of population. This explains why the prices of home-fed beef and mutton have not declined in view of the vast increase in the importation of frozen meat.

Despite the persistent reduction revealed by the official returns of flocks and herds in the United States from 1893 to 1900, the exports thence of cattle, sheep, and beef all showed great expansion in 1901. It is, therefore, of comparatively little use to endeavour to estimate the shipments in the near future on the basis of these returns alone. Although prices may be low here, the export of cattle or beef to Great Britain goes on irrespective of that fact, provided other conditions in the States call for the relief of the local markets; while, if prices are high in England, the export from the States appears to be capable of immediate expansion. The shortage in the 1901 maize crop, however, and the consequent forced selling of

cattle during the past three months, have already led to a marked advance in prices of fat stock in the States. Trade there is decidedly brisk at present; and these considerations warrant the expectation that there may be some slackening in the export trade in the near future.

Export of chilled beef from Canada may show some slight growth; and small additions to the total supplies of meat may arrive in the form of chilled beef from the Argentine Republic; but the relation of these two factors to the trade as a whole must remain unimportant for some time to come.

A good deal of interest is being shown by the Russian Imperial Government in the development of a meat export trade to this country. Small quantities of Russian beef have come to hand in recent winters, but the quality and condition were not good enough to command encouraging results. Possibly, with proper transit facilities and Government encouragement, a larger trade might be successfully carried on; but it is not likely to assume any importance during the next twelve months.

Further satisfactory experience has been gained in South Africa during the past twelve months of the suitability of Australian frozen beef and mutton for military purposes, and the British Government has just recently called for tenders for extensive supplies to be delivered there during 1902. These will probably be drawn mainly from Australia, and, together with the quantities to be delivered for military consumption in the Philippines and at the Mediterranean ports, must materially curtail the export from the Commonwealth to the United Kingdom.

The latest cable advices from Australia point to a continuance of the drought conditions over a considerable part of the continent, and there is consequently little or no prospect of heavy shipments of either beef or mutton being sent forward in the immediate future. The supply of lambs is already nearly exhausted, so that receipts in the coming spring are certain to be moderate. From New Zealand complaints are general as to the backwardness of the season, but apparently the output of both mutton and lamb is expected to be at least equal the deliveries of last season. Beef is at present scarce and dear, with only slight prospect of last year's export being increased. In the River Plate the season is reported to be unusually favourable, and everything points to a still larger output of both beef and mutton in the near future. The existing freezing works will continue to operate to their full capacity, and in April next the new works at Bahia Blanca are expected to be opened. It is believed by those engaged in the trade that even if the export of live cattle and sheep be resumed the operations of the freezing works will not thereby be checked to any material extent.

The demand, apart from the normal increase resulting from growth of population, must be influenced to a large extent by the general state of trade in this country. At present that is only moderately good, and a continuance of the war will almost certainly aggravate the existing dullness. As soon, however, as peace is secured, the spurt which must follow in all kinds of business may be expected to benefit the meat trade almost immediately. On the whole, the probabilities are mainly in favour of a fairly good year, with possibly some early improvement in prices owing to short shipments afloat and light home supplies.

NEW BOOKS, etc.

CASELL AND COMPANY, LTD. (London, 1903.) *With the "Ophir" round the Empire: an account of the tour of the Prince and Princess of Wales, 1901.* By WILLIAM MAXWELL, Special Correspondent of the *Standard*. Illustrated. 8vo., pp. xviii, + 332. (Price, 6s.) This is an admirable record of the memorable tour of their Royal Highnesses the Prince and Princess of Wales, during which they journeyed nearly 47,000 miles, and visited seventeen of the British possessions. The author, who accompanied the expedition in the capacity of newspaper correspondent, has his letters to the *Standard* in the present volume, and with the addition of new matter, has made a very attractive and readable book, containing a graphic and striking description of this remarkable voyage which marks an epoch in the history of the Empire. One of the chief objects of this long tour was the opening at Melbourne on May 9th of the new Federal Parliament of the Commonwealth of Australia, but the most important result has been that it has brought prominently to notice the intense patriotism and love for the Mother-country existing in all her colonies without exception. In his introductory observations the writer says that "in Canada, in Australia, in New Zealand, in South Africa, and the Islands of the Sea, the presence of the Prince and Princess has quickened the spirit of brotherhood, and brought us nearer to the accomplishment of the desire of statesmen and patriots. Under the shadow of the sword we have seen that pride of race and loyalty to the Empire, an undying impulse. . . . In years to come, when destiny has set them on the throne of this great Empire, the Prince and Princess will not be strangers to their people in the uttermost ends of the earth. They have noted the material, moral and social condition of the people, and the resources and potentialities of their countries. They have been the central figure in a succession of brilliant ceremonies. Everywhere they were received with a heartiness that must have assured them of the sincerity and attachment of the colonists. In the colonies it is recognised that loyalty lies at the root of every powerful nationality, and that security and progress are made certain by the unity of the Empire, by the defence of its rights, and the maintenance of its prestige." Mr. Maxwell's book will be found most interesting as regards the great variety of people and races that live under the British flag. The volume contains numerous photographic illustrations of a highly artistic character.

GEORGE BELL AND SONS. (London, 1902.) *The Life of Napoleon I., including new materials from the British Official Records.* By JOHN HOLLAND ROSE, M.A., late Scholar of Christ's College, Cambridge. With illustrations, maps and plans. In two vols. Large post 8vo., pp. 594 + 512. (Price, 16s.) The life of Napoleon Bonaparte has often been written, from various points of view, conveying very different ideas of the merits and faults of this great military genius. The writer of this present work has had the special advantage of being able to search the English Foreign Office records, and his examination has yielded much valuable information on the subject. These records show that the policy of the English Government, though weak at first, became sound and consistent, and grew stronger towards the end. He has also consulted nearly all the works relating to the period that have already been published, and has produced a remarkably clear and lively account of the wonderful career of this "scourge of Europe." He has dealt almost exclusively with the political and military aspect of Napoleon's life, only referring to his private life where it is connected with public affairs. Mr. Rose's work is written in a concise yet graphic style, suitable to the stirring incidents and momentous events portrayed, and is free from any personal bias. The numerous illustrations and maps inserted in the volumes add much to their interest, and there is a useful index appended.

GEORGE PHILIP AND SON. (London, 1902.) *Mosquito Brigades and how to organise them.* By RONALD ROSS, F.R.C.S., D.P.H., F.R.S. 8vo., pp. vi. + 98. (Price, 3s. net.) The discovery made by Major Ross that the germs of the most important tropical diseases, malarial fever, yellow fever, and elephantiasis, are inoculated into human beings by the bites of mosquitoes, has caused a revolution in tropical hygiene. In this volume the author gives full and clear instructions as to the methods to be adopted for the destruction of these pests, and directions as to the organisation and duties of brigades of men to be employed in the extermination of the larvæ and full-grown mosquitoes. The information given is based upon experience gained during many years' study of mosquitoes in various parts of the world, and more especially upon the actual results of the operations now being carried on by the Liverpool School of Tropical Medicine in West Africa. Already the system of killing mosquitoes at each place where yellow fever breaks out is bearing fruit, for it is stated that at Havana no case of yellow fever occurred during last November, a condition which has not obtained for many years.

JOHN MURRAY. (London, 1901.) *China, her History, Diplomacy and Commerce from the earliest times to the present day.* By E. H. PARKER, formerly H.M. Consul at Kiangchow. With maps. Second impression. 8vo., pp. xx. + 332. (Price, 8s.) The writer of this interesting book has had many years' residence in China, having spent a quarter of a century at many of the ports, besides travelling through some of

the provinces, and also in Corea and Burma. He has already written many works on subjects connected with the Chinese Empire, and was, therefore, well prepared for an examination of the Chinese historical records from which the greater part of the present work has been compiled. In the preface, Mr. Parker says that, in struggling through the voluminous chapters of native records on "barbarians," he was greatly struck with the fidelity of the Chinese annals. After giving a short geographical and historical sketch of the Empire, Mr. Parker describes the great trade routes which have been in existence from the earliest times, and are, with one or two exceptions, exactly the same now as they were 2,000 years ago, both by land and sea. "The marts, with similar rare exceptions, are either the old marts or are near them, or have a special traceable reason for their modified existence." An account is next given of the beginnings of the relations between China and foreign countries, with a list of the numerous treaties that have been entered into from the first treaty with Russia in 1689, down to that with the Congo State in 1898. After describing the various nomad tribes that have harassed the borders of China from time immemorial, the author deals with the conditions of modern trade and the various ports that have been opened to it, together with the methods of collecting the revenue, the salt gabelle and *likin*. The volume conveys a clear and vivid idea of the personal characteristics of the Chinese, which will serve to make them better known to the outside world. An excellent glossary and full index are appended to the work, and numerous maps are inserted to illustrate the text.

"KNOWLEDGE" OFFICE. (London, 1902.) *Wireless Telegraphy: a Popular Exposition.* By G. W. DE TUNZELMANN, B.Sc., M.I.E.E., &c. Second edition. 8vo., pp. 104. (Price, 1s. 6d.) This little volume is based upon a series of papers on wireless telegraphy which were published in *Knowledge*, and presents a popular account of this new means of communication in a manner adapted to any readers who are interested in knowing something of the historical development and practical working of electric telegraphy without the aid of connecting wires, which has now been shown to be of great value to commerce. The book is written in a very clear and lucid style, and with two exceptions, without the use of those mathematical formulæ which are incomprehensible to the non-scientific reader. Within the last month, Signor Marconi has proved the practicability of sending messages across the Atlantic by wireless telegraphy, and further developments may shortly be looked for.

NEW SOUTH WALES GOVERNMENT PRINTER. (Sydney, 1901.) *Picturesque New South Wales: An Illustrated Guide for Settler and Tourist.* Prepared under the direction of T. A. COGHLAN. La. 8vo., pp. 123. This beautifully illustrated guide book conveys to settlers and tourists a remarkably clear idea of the natural wealth of the State of New South Wales, and the splendid scenery which it possesses. The descriptive letterpress is written in a popular style which cannot fail to arouse interest in this highly favoured country. The advantages it offers to the commercial man, as well as to the agriculturist and the artist, are graphically described; the numerous illustrations are all from photographs and greatly add to the attractiveness of the book, which has been produced under the supervision of Mr. Coghlan, the well-known Government Statistician of New South Wales, a fact which guarantees the accuracy of the information given.

THE OXFORD UNIVERSITY PRESS. (London, H. PROWDE, 1901.) *The Relations of Geography and History.* By the Rev. H. B. GEORGE, M.A. With two maps. Crown 8vo., pp. 296. (Price, 4s. 6d.) The relations of geography and history are both intimate and important, and geographical influences have accounted for much that has happened or is happening in the world. Geographical knowledge affords valuable data for solving historical problems that without such knowledge would be enveloped in doubt and obscurity, and the movements and migrations of population on the surface of the globe have been largely governed by geographical contours and conditions. In this volume the effects of these geographical circumstances are well traced, and some striking examples are given of the way in which historical events have been shaped, especially in connection with the wars that have been waged in Europe. The chapter on the Alpine passes is specially interesting. A knowledge of the geography and climate of a country helps greatly in explaining its history, more particularly that of earlier times, and the study of the connection of history with geography, as set forth in this volume, will be found of great value by all students of the subject.

T. FISHER UNWIN. (London, 1901.) *The West Indies and the Empire: Study and Travel in the Winter of 1900-1901.* By H. DE R. WALKER. With coloured map. 8vo., pp. 264. (Price, 7s. 6d. net.) This volume gives in an amplified form the contents of a paper which Mr. de R. Walker read in June last before the Royal Colonial Institute, with new additional matter. It presents in a lucid and graphic manner the present state of the sugar industry in the West Indies, and the development of other resources. The resuscitation of the sugar industry is essential to the permanent prosperity of these Colonies. The social condition of the negroes, who form the bulk of the population, is fully dealt with, and the introduction of the indentured East Indian is shown to have been a benefit. With regard to taxation and administration the author is in favour of the union of as many of the West Indian Colonies as possible under one government, and that, in the interests of all sections of the community, direct government under the Crown is preferable throughout the West Indies to any system of representative institutions. There is a chapter on travel in the West Indies which contains much information useful for tourists.

CITY BRANCH OF THE IMPERIAL INSTITUTE, AT 112, CANNON STREET, LONDON, E.C.

The CITY BRANCH OF THE IMPERIAL INSTITUTE embraces:—

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9. The Institute will undertake to procure, and supply, at cost price, translations into any language, of trade circulars, prices-current, etc., and the conversion of weights, measures, coinages, etc.

SCHOOL OF MODERN ORIENTAL STUDIES.

Founded by the Imperial Institute in union with University College and King's College, London.

In 1887 it was suggested that a school of Modern Oriental Studies should be organised as a branch of the Institute, in imitation of the very efficient establishments of this kind which are carried on, with Government resources, in France, Germany, and Austria. The promulgation of this proposal led to negotiations with the authorities of University College and King's College, London, which resulted in their co-operation with the Institute in the establishment of the School. A Special Committee having been appointed to decide upon a system of work, it was arranged that classes for instruction in the Oriental languages required by students qualifying for examinations for the Indian Civil Service, should be held at University College, while modern Oriental languages, other than the Indian languages, should be taught at King's College, and that the Imperial Institute should undertake the general administrative and financial work. The School was officially opened in January, 1890, when an inaugural address was delivered by Professor Max Müller at the Royal Institution, in the presence of His Royal Highness the Prince of Wales. The daughters of the late Colonel W. J. Ouseley (Bengal Army) have established and endowed, in his memory, three scholarships, in Arabic, Persian, Hindustani, and other Oriental languages, in connection with the School, each one of the value of not less than £50 per annum. The following Scholarships have already been awarded:—

YEAR.	SUBJECT.	EXAMINERS.	AWARDED TO.
1892	Arabic .	{ Dr. WELLS Prof. SALMONÉ	No Competitors.
1893	Arabic .	Dr. WELLS	Mr. HENRY LEITNER, junr.
"	Persian .	{ Mr. JOHN T. PLATTS MIRZA HUSSEIN KULI KHAN	Mr. E. DENISON ROSS.
1894	Hindustani .	Mr. JOHN T. PLATTS	No Competitors.
"	Persian .	Dr. ROBERT BRUCE	Mr. DIWÂN TEK CHAND.
"	Chinese .	Sir THOMAS WADE	No Competitors.
1895	Turkish .	Dr. WELLS	Mr. L. STENNETT AMERY.
"	Hindustani .	Mr. J. T. PLATTS	Mr. ASGHAR ALI.
"	Chinese .	"	No Competitors.
1896	Burmese .	Gen. R. D. ARDAGH	Mr. LEE AH YAIN.
"	Arabic .	Dr. WELLS	Mr. H. G. SARWAR.
"	Marathi .	Mr. J. W. NEILL	Mr. V. R. PANDIT.
1897	Gujarati .	Dr. S. A. KAPADIA	Mr. RUSTUM D. N. WADIA.
"	Persian .	Mr. J. T. PLATTS	Mr. P. S. PATUCK.
"	Chinese .	Mr. W. A. PICKERING, C.M.G.	No award.
1898	Bengali .	Prof. J. F. BLUMHARDT	Mr. B. C. GHOSH.
"	Turkish .	Dr. WELLS	Lieut. A. M. SETON, R.A.
"	Chinese .	"	No Competitors.
1899	Arabic .	Dr. WELLS	Mr. G. A. KHAN.
"	Persian .	Dr. ROSS	Mr. R. M. DAVIS.
"	Sanskrit .	Prof. C. BENDALL	Mr. S. K. GHOSE.
1900	Hindustani .	Mr. J. T. PLATTS	Mr. N. HAGOPIAN.
1901	Marathi .	Prof. J. W. NEILL	Mr. J. R. MARTIN.

An OUSELEY SCHOLARSHIP of £50, tenable for two years, will be awarded this year, should sufficient merit be shown, for proficiency in PERSIAN. *No person will be admitted to competition for a Scholarship in a language which is his own mother tongue, nor for a Scholarship in a language allied to his mother tongue.*

The examination takes place early in July, 1902.

Competitors must give notice on or before July 1, 1902.

The ages of Candidates are to be above 17 and under 25 years on January 1 of the year of examination.

Further particulars may be obtained from the Secretary, S.M.O.S., Imperial Institute, S.W.

GENERAL INFORMATION FOR INTENDING STUDENTS AT THE SCHOOL.

The classes which the "School of Modern Oriental Studies" comprises, are divided under two heads. DIVISION I. includes classes for all Oriental Languages especially required by Students qualifying for examinations for the Indian Civil Service, the instruction being of the same character as that provided for some time past at University College and at King's College. This Division includes instruction in Sanskrit, Bengali, Hindi, Hindustani, Tamil, Telugu, Punjabi, Pali, Marathi, Gujarati, Arabic, and Persian.

DIVISION II consists mainly of classes for Modern Oriental Languages other than the Indian Languages. The courses of tuition are of a practical rather than of an academic character; they have particular reference to commercial and official requirements and to the facilitation of colloquial intercourse with natives of Oriental Countries.

It is in contemplation, so soon as the number of students warrants the expenditure, to secure the services of native readers and teachers of conversation in connection with the classes of this Division.

The classes under this Division are conducted at King's College, where arrangements will also be made for the establishment of evening classes.

The Languages taught in Division II. comprise Colloquial Arabic, Armenian, Modern Greek, Colloquial Persian, Russian, Turkish, Chinese, Burmese, Japanese, Malay, and Swahili.

Arrangements have been completed by the Managing Committee and approved of by the Governing Bodies of the Imperial Institute and of the two Colleges, for the pursuit of studies relating to the history, literature, commercial and physical geography, political economy, and the natural and industrial resources, of the countries and districts in which the various languages are used.

Special Lectures or courses of Lectures will be delivered from time to time, in connection with the School, by experts or specialists, in any of the foregoing subjects.

There are three terms, of about ten weeks, in each year, as follows:—

SPRING TERM—commencing about the middle of January.

SUMMER TERM—commencing early in May.

AUTUMN TERM—commencing about the middle of October.

A fee of THREE GUINEAS per term will have to be paid, in advance, by each Student for each Language taken up for instruction. This payment will entitle the Student to the use, within the College, of text books, dictionaries, and works of reference required in connection with the particular Language taught, and to the use of all the facilities which it is proposed to secure in the development of the School.

Accommodation is provided at the Imperial Institute to enable Students to pursue their studies at hours when the classes are not held. The Libraries of both Colleges will be open to Students in any of the classes of the School, during the usual hours of study.

Intending Students should communicate with the Secretary at the offices of the Imperial Institute, London, S.W., where the registration of Students will take place, and where all information regarding the School will be supplied.

MONTHLY COMMERCIAL AND INDUSTRIAL SUMMARIES.

GENERAL COMMERCE AND INDUSTRY.

UNITED KINGDOM.

British Corn.—The following statement gives the average price of British Corn during the four weeks of February this year, as compared with February, 1901:—

1901.			1902.		
Wheat.	Barley.	Oats.	Wheat.	Barley.	Oats.
26/7	25/7	17/8	27/4	26/7	20/2
26/8	25/7	17/7	27/2	26/9	20/3
26/4	25/4	17/7	26/11	27/5	20/3
26/1	25/-	17/7			

Fisheries.—The total amount of Fish, excluding Shell-fish, landed on the English and Welsh coasts from the fishing grounds during January this year was 479,002 cwt., value £519,163, as against 488,296 cwt., value £474,808, during the same month last year. The value of Shell-fish was £24,391 as against £26,582.

COLONIES.

British Guiana.—**GOLD-MINING.**—Commenting on the decreased output, which may be due to some extent to extra attention given to diamond-mining, the *Demerara Daily Chronicle* says that influences are now at work which promise to promote the development of the industry very materially in the near future, outside capitalists having been engaged in introducing for mining purposes machinery of the most advanced character, and it may reasonably be assumed that they are satisfied that the additional outlay will be justified by the results. Mechanical dredging is being tried on the Barima with satisfactory results. The advantages seem to be that a relatively small amount of capital is required for the starting of operations, and that, comparatively speaking, only a few labourers are needed to keep the dredger running. On the authority of "a colonist interested in the gold industry" an expert who has prospected in the Barima river estimates that "a 500-ton dredger working 200 days at 24 hours per day will make a profit of £25,000 sterling. The cost of a dredger would be about £3,000." The experiment now in progress should determine the amount of reliance that can be placed on what is rightly described as a "remarkable anticipation." "One circumstance," the *Demerara Chronicle* remarks, "must be borne in mind; dredging is not an undertaking for the local man with no experience of the system and with little or no capital. Men who mean business, with money to support them, should have the prior claim for concessions, and the indiscriminate granting of large areas to applicants who obtain them solely for the purpose of speculation ought carefully to be guarded against. This class of applicant is but a stumbling-block to progress." The prospect of a considerable development of the gold-mining industry in British Guiana during the course of the present year, however, is not restricted, it appears, to the development of dredging. The "hydraulicizing" system is also to be extended to the goldfields. Options have been secured with this object in the Potaro district, and the installation of an elaborate hydraulic plant at Omai is approaching completion. The hydraulic and the dredging processes are the two methods most suitable to the conditions under which gold is found in British Guiana.

Canadian Trade with the West Indies.—The Dominion Statistician, Mr. George Johnston, has gathered together an interesting collection of papers dealing with trade between Canada and the West Indies which will be forwarded to the Commission which is to investigate business openings in the West Indies on behalf of the Canadian Manufacturers' Association. The figures show that, in spite of the outlay of a large sum of money to promote trade between Canada and Jamaica, Trinidad, Barbadoes, and the rest of the islands, business has steadily declined.

Cape Colony.—**TRADE IN 1901.**—The imports for 1901 were £23,990,543, as compared with £19,678,336 in 1900 and £19,207,519 in 1899. The specie imports were £2,575,800, against £2,516,520 in 1900 and £3,836,100 in 1899. Of course the expansion in imports is chiefly due to the presence of the troops and the expenditure on supplies. The exports are a better test of the reviving trade of the Colony. The total for 1901 was £10,873,273, as compared with £8,147,670 in 1900 and £23,247,258 in 1899. The principal items in the exports were colonial produce, diamonds and gold, all of which showed increases. How much South Africa depends on the Rand gold industry is shown by the fall in exports between 1899 and 1900. Of this fall £13,478,888 was due to the cessation of mining. The trade of the Cape with the Transvaal amounted to £1,162,000 last year, against £188,500 in 1900, and the trade with Rhodesia was £842,900, against £414,900.

New South Wales.—**THE SYDNEY HARBOUR COLLIERIES.**—Mail advices report the striking of coal in the Birthday shaft of the Sydney Harbour collieries. The coal is said to be of excellent quality, so that in addition to the facilities offered by a splendid harbour, Sydney now possesses good coal. The arrangements are such that the coal can be delivered direct from the screens into the hold of the vessels waiting to receive it, and the work will be accomplished by powerful machinery with the greatest expedition. As there is a depth of 26 feet alongside the wharf at low water, and the length (580 feet) is adequate for all reasonable requirements, it would appear that very large vessels can coal there with great despatch and convenience. The advantage that will be possessed by the Harbour collieries in this respect is obvious.

Queensland.—**PEARL SHELL INDUSTRY.**—In the annual report of the Marine Department, the Queensland Inspector of Fisheries (Mr. J. R. Tosh) states that the pearl shell industry of Torres Straits has reached a critical stage. From the time when the earliest shellers, each with a schooner and a few open boats, picked up shell at practically low-water mark, there has been a gradual evolution in skill, in appliances, and in organisation, to meet the increasing difficulty of obtaining shell. Year by year the shell-bearing area has been pushed further from the shore, and year by year the boats have ventured further afield. The grounds will be more thoroughly worked than ever before, and this means that the depletion of the known areas will be materially hastened. Unfortunately, no one knows how far the shell-bearing area extends, and in the circumstances it is difficult to say how we stand for a supply of shell for the coming years.

Unless some precautions are taken, one can look forward to a time when all the shelling grounds within a distance to be reached from Thursday Island will have been worked down to a payable limit; at that point the fleets will sell out or depart in search of pastures new, and the fishery will be practically closed down. There is no telling when the paying limit will be reached.

INDIA.

Afridi Wax-Cloth.—According to the *Times of India*, Mr. George Watt, the Reporter on Economic Products, has succeeded in inducing the Afridi wax-cloth workers to impart the secret of their craft, which has hitherto puzzled all enquirers into Indian industries. Afridi wax-cloth, a kind of raised colour painting on cotton fabrics, has been almost from time immemorial, and is, a well-known product of certain workshops in Peshawar, Lahore, Calcutta and Bombay; but until Mr. Watt set about his enquiries, complete ignorance prevailed, outside the circle of artisans, as to the constitution of the medium employed. With the assistance of Mr. Roe, the Secretary to the Peshawar Municipality, Mr. Watt was able to ascertain that the medium, known as *rogan*, is a peculiar product of the safflower seed. The method of preparation, which is carried on entirely at Peshawar, is to boil the oil—expressed from the seeds by cold pressure—for 12 hours, and then throw the heated fluid into shallow pans of cold water. Under this treatment it swells up into a thick, jelly-like substance, which is the *rogan* of commerce. Before being applied to the cloth, it is mixed with some mineral colour and drawn out into fine threads on a pointed style with which the pattern is traced. The operators, who are invariably Afridis, attain a very high degree of skill, and possess marked artistic abilities. The weight of Afridi wax-cloth—an Afridi woman's costume would turn the scale at over 13 lb.—makes it unsuitable to articles of European dress; but the ever-increasing demand for household drapings gave a ready outlet for the Afridi artisan's skill, to which he has readily adapted himself. Careful tests made in Calcutta also showed that as a waterproofing material, or as a material to be used in the manufacture of linoleum, *rogan* has a distinct claim to careful consideration, and is, in some respects, superior to linseed.

The Mysore Sugar Industry.—In the course of an interesting note on the Mysore sugar industry, Dr. Lehmann said that notwithstanding the fact that iron mills had taken the place of the old wooden mills, and much better extraction of the juice obtained, yet, when viewed in the light of the progress made in other countries, the sugar industry was one of those decaying industries which it was in the interests of the State to revive. The native refining industry was practically already dead in Mysore, and the so-called native refined sugar which was sold to the bazaars was simply sugar refined in the large factories, imported into the State, and re-melted in the bazaars. The fate which had overtaken the native refining industry was sure to overtake the jaggery-boiling industry sooner or later, and in fact the sooner jaggery-boiling was abolished the sooner the sugar industry would regain some of its former splendour. The methods of cultivating the cane would also have to be improved. The same quantity of sugar-cane which produced 100 lb. of jaggery, from which 50 lb. to 62 lb. of refined sugar could be obtained, would give, if manufactured directly into refined sugar by improved machinery, about 70 lb. to 75 lb. of refined sugar. Such a loss evidently made all the difference between a flourishing and a crippled industry. Waste of fuel and other losses and drawbacks in jaggery-boiling had to be added, but could not well be taken into account, as they were to some extent off-set by drawbacks in whatever other system might be introduced. Still, the loss of 151 lb. on every 75 lb. of refinable sugar justified almost any effort to save it, and although the loss might be to some extent overcome—to what extent Dr. Lehmann was not prepared to say, but soon hoped to make experiments in that direction—by improving the system of jaggery-boiling, still, so long as jaggery-boiling was continued, the loss must go on to a very large extent, as was proved by all the leading sugar-producing countries having long ago abandoned all systems which were in any way similar to that in vogue in India.

FOREIGN COUNTRIES.

Exports to Guatemala.—The Consul-General of Guatemala calls the attention of shippers and merchants trading with that Republic to the regulations that all consular invoices, no matter from what port the goods are shipped, must be legalised solely by the Consul of Guatemala (where any) resident in the city in which the exporter's firm is domiciled; and that consular invoices must be dated at the place in which the exporter's firm is domiciled, and both the invoices and the sworn declarations must be signed by an authorised member of the exporter's firm.

Germany.—**TRADE RETURNS.**—The Imperial Statistical Office has reported the preliminary figures regarding Germany's foreign trade in 1901, showing that the total imports amounted to 44,304,857 tons, compared with 44,652,288 tons in 1900. There was a decrease of more than a million tons in the coal imports, and more than 500,000 tons in the iron and timber imports. The total exports amounted to 32,363,395 tons, compared with 32,681,747 in 1900. The increase in iron exports was nearly 800,000 tons, while exports of iron ore and of coal fell off heavily. The value of the imports for the last calendar year was estimated at 5,967,000,000 marks, as compared with 8,043,000,000 marks in 1900. Exports last year were valued at 4,759,000,000 marks, as against 4,753,000,000 marks in the previous year. The returns indicate very clearly the extent to which export prices have fallen, the substitution of 800,000 tons of manufactures of iron and steel, most of which were quite highly manufactured, for exports of iron ore and coal, failing to increase the value of the total exports appreciably.

United States.—**PRODUCTION OF PIG-IRON IN 1901.**—According to the American Iron and Steel Association, the production of all kinds of pig-iron in the United States in 1901, was 15,878,354 gross tons, against 13,789,242 gross tons in 1900 and 11,773,934 in 1898, the total increase in 1901 over 1900 being a larger one than the "boom" year 1899 showed over 1898. The whole number of furnaces in blast on December 31, 1901, was 266, against 232 on December 31, 1900.

The States supplying the principal production are shown in the following table:—

	Gross tons or 2,240 lb. (includes spiegeleisen).
	1901.
Pennsylvania	7,343,257
Ohio	3,326,425
Illinois	1,596,850
Alabama	1,225,212
Virginia	448,662
Tennessee	337,139
Maryland	303,186

Production according to fuel was as follows:—

	Gross Tons.
Bituminous	13,782,386
Anthracite	1,712,527
Charcoal	360,147
Charcoal and Coke	23,294

LABOUR MARKET.

General Statistics.—The *Labour Gazette* reports that employment improved during January, but it is not so good as a year ago. In the 151 trade unions, with an aggregate membership of 553,218, making returns, 24,470 (or 4.4 per cent.) were reported as unemployed at the end of January, compared with 4.6 per cent. in the 144 unions, with a membership of 545,539, from which returns were received for January, 1901.

TRADE DISPUTES

to the number of 33 began in January, 1902, involving 23,558 workpeople, of whom 6,898 were directly and 16,660 indirectly affected. The corresponding number of disputes in January, 1901, was 29, involving 17,754 workpeople. Of the 33 fresh disputes in January, 1902, 11 occurred in the mining and quarrying industries, 13 in textile trades, 4 in metal, engineering and shipbuilding trades, and 5 in other industries. Of the 33 new and old disputes of which the termination is reported, 6 were decided in favour of the workpeople; 13 in favour of the employers; and 14 resulted in a compromise. Changes in the

RATES OF WAGES

of about 156,678 workpeople were reported during January, of which number 2,783 received advances, and 153,895 sustained decreases, the net effect being a decrease averaging 5½d. weekly per head. The principal decrease was that sustained by 135,000 coal miners in South Wales. Changes affecting no less than 135,000 workpeople took effect under sliding scales.

COLONIES.

The monthly report, compiled by the EMIGRANTS' INFORMATION OFFICE, is as follows:—**Canada.**—The report of the Dominion Labour Department for January states "Employment is general, except in those branches of particular trades which are affected by the winter season, as outdoor construction works and the like; and in some parts the demand considerably exceeds the supply. The coal-mining industry on Vancouver Island (British Columbia) is, however, to be further excepted. Owing to recent fires in some of the mines, a temporary closing, and a part reduction of the working force for other reasons in others, a number of miners and their helpers have been unemployed." During 1901 the building, metal, engineering and shipbuilding trades were very busy, and the printing and many other trades were also well employed. There is a fair demand at the Rossland mines in British Columbia for miners and mine labourers, and a good demand for carpenters, painters, paper-hangers, and female servants, the latter receiving 20 dols. to 30 dols. a month, with board and lodging; a blacksmith, who can also do wheelwrights' work, can always get good wages in British Columbia. **Australasia (New South Wales).**—Reports from Yerrilderie and Hillston state that the only demand is for a few carpenters. At Orange the only demand is for female servants and a few farm labourers. At the Broken Hill silver mines work is very dull, owing to low prices, and many men are out of employment. (**Victoria.**)—The supply of labour is, for the most part, sufficient. The minimum wages for labourers in the pottery trade have been fixed at 36s. to 40s. per week of 48 hours, and for females over 18 years of age, employed in the making of general pottery, at 20s.; for compositors, letterpress machinists, and stereotypers in the printing trade, at 50s. to 52s. per week of 48 hours; for linotype or monoline work, at 63s. per week of 48 hours; for lithographers and bookbinders, at 52s. per week of 48 hours; and for general butchers, at 45s. per week of 52 hours. (**South Australia.**)—A report from South Australia states that there is a fair demand through the summer months for farm and general labourers at 15s. to 25s. a week, with board and lodging; that there is a good demand for female servants, but that there is no demand for miners, station hands or mechanics. (**Queensland.**)—A report from Brisbane states that there is practically no demand for more labour, except in the case of female servants. At Rockhampton the only demand is for female servants and a few farm or general labourers. (**Western Australia.**)—The dispute in the building trade at Perth and Fremantle has been settled; the week's work is fixed at 48 hours, and the rate of 1s. 4½d. an hour remains unaltered; piece work is abolished. (**New Zealand.**)—A report from Invercargill states that there is a good demand for farm and general labourers, shepherds and female servants, but not for mechanics, except for those competent to engage in gold dredging, which is an increasing industry. At Auckland, farm and general labourers, station hands, female servants and carpenters are wanted, but not miners. At Wellington, miners, female servants, engineers and blacksmiths are in demand. In most parts of the colony there is a demand for competent farm labourers and lads for milking.

South Africa (Cape Colony).—No one is now allowed to land in South Africa without a permit. This must be applied for at the Permit Office, 39, Victoria-street, London, S.W. The applicant must possess £100, or prove that he is in a position to maintain himself in South Africa. Applicants living within 50 miles of London must apply in person. These permits are no guarantee that the holders will be allowed to proceed inland. The Permit Office does not include persons wishing to go out to farm, without any definite farm in prospect, amongst those having knowledge of a trade or profession. From a large number of official reports, dated at the end of 1901, which have been received from all parts of the colony, it appears that there was a demand for skilled labour in King William's Town, Grahamstown, East London, Wellington, Beaufort West, Somerset West, Stellenbosch, Willowmore, Port Nolloth, Mafeking, and some other small places, and for female servants in many parts. This demand was owing to so many men having joined the irregular forces at higher wages, and to various military demands. Rates of wages and prices of provisions were rising in most districts. (**Natal.**)—There is a good demand throughout the colony for men in the building trades, such as carpenters, bricklayers, stonemasons, plasterers, painters, etc. Competent men of good character can obtain reduced third-class passages at £10. 2s. and 12 guineas a head by applying to the Agent-General for Natal, 26, Victoria-street, London, S.W. A few railway guards, platelayers, locomotive boiler makers, locomotive fitters, turners, and machine men of five years' experience are also wanted. Permits to land must be obtained from the Permit Office, 39, Victoria-street, London, S.W. The cost of living in Natal has risen considerably. (**Orange River Colony and Transvaal.**)—Only refugees, Government employes, and persons engaged in a service of a public nature will be permitted to proceed to the Transvaal. Candidates for the new South African Constabulary should apply to The Recruiting Officer, S.A.C., Recruiting Office, King's-court, Broadway, Westminster, S.W.; they must be good riders, good shots, single, strictly sober, and from 20 to 35 years of age; they will be given free passages to South Africa. Farriers also are wanted for this Force.

EMIGRATION AND IMMIGRATION.

* * *The Imperial Institute acts in concert with the Emigrants' Information Office (which is under the direction of the Colonial Office), of 31, Broadway, Westminster, S.W.; and also with the British Women's Emigration Association, now temporarily carrying on its work in rooms at the Institute. The Handbooks and Quarterly Circulars issued by the Emigrants' Information Office may be obtained at the Commercial Intelligence Office. Special information and practical advice respecting Canada and Cape Colony will also be furnished by the Curators of these Sections.*

UNITED KINGDOM.

General Emigration.—During January this year, 12,843 persons left the United Kingdom for places out of Europe—about the same number as in January, 1901. There was an increase of 10 in the number of British and Irish emigrants to South Africa, of 330 in the number to British North America, whilst fewer were bound for Australasia and the United States. The sum total of emigrants—12,843—was made up of 7,819 British and Irish, and 5,024 foreigners.

Alien Immigration.—According to the monthly return issued by the Board of Trade, the number of aliens that arrived from the Continent at ports in the United Kingdom during the month of January amounted to 6,935, as against 7,414 so returned for January, 1901. Of these 1,251 came from Germany, 1,151 from Holland, 873 from Scandinavian ports, and 788 from Dieppe. The number stated to be *en route* to America or other places out of the United Kingdom is given as 2,803, and compares with a total of 2,324 in the corresponding return of the previous year.

British Women's Emigration Association.—The hon. sec. of the British Women's Emigration Association reports the number of applications from January 21 to February 21, to be 420.

The dates of the Protected Parties to Canada for this season are now fixed, viz.: April 17, May 22, July 4, August 7, September 11, and October 16. These will sail by the ss. *Vancouver* to Quebec. A party of young ladies for situations in the North-West Territories is also sailing on March 27, in ss. *Dominion* to Portland. It is anticipated that a large number of young women will emigrate this year to Canada, as the free passages to Australia are suspended. The Association is pledged to protect its travellers throughout their journey, and this makes it imperative to provide accommodation for one night in London, for those who start from Euston at 7 a.m. Some of them often need it for several days, when they have left their situations or parted with their "homes," while waiting to sail. Those going to Africa and Australia, New Zealand and the States are also obliged to sleep in London the night before they embark, if their homes are at a distance. This necessity has made the Council of the Association decide that the time has now come to open a Hostel of its own in London, that its travellers and other respectable women may obtain safe, comfortable and economical lodgings. The initial expenses will be heavy, but the one Central British Hostel in London will serve for emigrants to all the Colonies.

The Home Country should not be behindhand in furnishing this essential, for the comfort and advantage of the women leaving their native land.

The Colonies have already established Reception Homes in their principal towns, so as to minimise the dangers and difficulties to the young women landing on their shores. The Home at Westminster used by our travellers for the last six years is now closed. Will not some of the believers in the benefits of emigration help the Association to found a good house of its own in London? Consider the advantage to a girl, a stranger in that great city, to be able to be sure of finding a safe shelter and kind welcome, on the first night of leaving her home and her friends, to travel to the other side of the world. There are always many things to be attended to that last evening, not infrequently one of the party has left behind her ticket or her keys, or there are papers to be signed, last words to be spoken or written home.

It is important that this Hostel should be opened without delay, so as to have it ready for the Canadian season, and also for the large numbers for South Africa which it is anticipated will be proceeding out there as soon as peace is established.

The hon. sec. of the British Women's Emigration Association begs for contributions towards the Hostel Fund; these may be forwarded to the Women's Emigration Office, at the IMPERIAL INSTITUTE.

The Australian 3rd class rates are now fixed at £17 the lowest price, and £19 for a berth, in a four-berth cabin. Some places have been reserved in the deck cabins of ss. *Austral* for April 11, and young women intending to go to either of the Australian ports, are advised to join a party for that date. The number of persons who travelled under the care of the Association in 1901, was 447.

The annual report of the work of the past year will be issued in April, in time for the annual meeting. The magazine *The Imperial Colonist*, is to be enlarged by the addition of four more pages, and interesting articles are promised for future numbers. The circulation appears to be satisfactorily increasing. It will be forwarded monthly to anyone who sends an order, enclosing 2s. 6d. to cover postage, for the yearly subscription, to the hon. sec. British Women's Emigration Association, IMPERIAL INSTITUTE, London.

COLONIES.

Canada.—NEW IMMIGRATION OFFICE AT WINNIPEG.—The Provincial Government has decided to establish a new immigration office in Winnipeg as a branch of the Department of Agriculture and Immigration. The object of the department in establishing this branch is to provide a place which will be easy to reach by immigrants who desire to obtain information about the province and who come over the Canadian Pacific Railway. Maps and pamphlets will be kept for purposes of distribution, together with samples of grain and other matter which will be useful to new arrivals and which will give information without making it necessary for people to go to the Government buildings in order to obtain it. In addition to this the department intends to use the branch as a means of placing immigrants who arrive in the province, seeking employment in the spring or while harvesting operations are on, and for this purpose a list of farmers requiring hands will be kept.

CUSTOMS TARIFFS.

COLONIES.

Australian Commonwealth.—BYE-LAW RESPECTING FREE IMPORTATION OF MINOR ARTICLES USED IN THE MANUFACTURE OF CERTAIN GOODS.—The *Commonwealth of Australia Gazette*, for 20th December last, contains a copy of a Customs Bye-Law to the effect that certain "minor articles" used in the manufacture of bellows, blinds, boots and shoes, fishing rods, furniture, harness, saddles, whips, hats and caps, metals and vehicles, etc., within the Commonwealth, may be imported free

of duty. The list of "minor articles" referred to in the Bye-Law is in considerable detail, and can be seen by persons interested on application to the Commercial Intelligence Branch of the Board of Trade, 50, Parliament-street, S.W., any day between the hours of 10 a.m. and 5 p.m.

BYE-LAW RESPECTING PIECE-GOODS USED IN THE MANUFACTURE OF WATERPROOF CLOTH. The copy of the above-mentioned *Gazette* further contains a Customs Bye-Law notifying that "imported piece-goods not containing silk may be delivered at a duty of 10 per cent. *ad val.*, for the purpose of being manufactured into cloth made waterproof with india-rubber, on the condition that the manufacture is carried on in a warehouse licensed under the Customs Act, 1901."

THE NEW TARIFF.—The Federal House of Representatives has confirmed the Excise duty on grape spirit of 11s., and has raised the Excise duty on barley, malt, molasses, and maize to 12s. 6d., and on other spirits to 13s. The import duty remains at 14s.

British South Africa.—DUTIES ON GOODS FOR TRANSVAAL *via* NATAL.—The *Natal Mercury* states that it has been notified that on and after 1st February, as regards goods destined for Pretoria and Johannesburg, Transvaal Customs Duties will not be collected in Natal, but will be payable at the place of destination, to the proper officers of the Transvaal Customs stationed there. Therefore, as regards Pretoria and Johannesburg (and those places only for the present), Transvaal Customs entries will not be accepted by the Natal Customs. Goods will, however, still be refused by the Railway Department unless the railway-consignment-note has been endorsed by the Natal Customs with the usual stamp and signature. In the case of goods from bonded warehouses, or, when dutiable, from ship's side, the railway-consignment-note will be stamped and signed on production of the Natal transit-entry. In the case of goods from open stocks or of Colonial goods, or of goods free from Customs Union duties, one entry only is to be passed, and, on production of this entry, containing all particulars of export, the railway-consignment-note will be stamped and signed. The usual permits to import into the Transvaal must, however, still be obtained and produced. This notice applies only to Pretoria and Johannesburg. Goods for other stations and places must be cleared in Natal as hitherto.

Transvaal.—IMPORTATION OF GOODS.—The Transvaal *Government Gazette* of 10th ult. publishes the following Proclamation by His Excellency Lord Milner, the Administrator of the Transvaal:—

Whereas it is necessary to amend Proclamation No. 2 of 1901 (see *Board of Trade Journal* for 28th March last, pp. 761-2), and to make further provision for the importation of goods into the Transvaal:

Now, therefore, by virtue of the authority in me vested, I do hereby declare, proclaim, and make known as follows:—

1. Proclamation No. 2 of 1901 shall, from and after the 1st day of February, 1902, be repealed, and from and after the said date the importation of goods into this Colony will be subject to the following conditions:—

(a) A permit for such importation shall be previously obtained from the Military Governor of Pretoria, or his duly appointed deputies.

(b) Customs duties shall be paid on all goods imported in accordance with the laws and regulations of the Customs.

These duties shall, until further provision be made therefor, be levied according to the Customs tariff leviable by the Laws of the late South African Republic, which shall be read, however, as if the following appeared therein in the schedule of articles exempted from duty:—

"Public stores, imported or taken out of bond by, and *bonâ fide* for the sole and exclusive use of the Government of His Britannic Majesty or the Government of any Colony, State or Territory in South Africa, provided that a certificate be delivered to the Customs given under the hand of a principal Imperial, Military, Naval, Civil, Commissariat or Ordnance Secretary or Officer, or under the hand of a Secretary to any Government as aforesaid, setting forth that any duty levied on such public stores would be borne directly by the Treasury of his Government; and provided further that no portion of such stores used or unused shall be sold or otherwise disposed of so as to come into the possession of or into consumption by any parties not legally entitled to import the same free of duty, until the intention so to sell or dispose of the stores shall have been notified to the principal officer of Customs in this territory, to whom the duty leviable according to the tariff then in force shall be paid by the Government selling or disposing of the stores: Wine, spirits, and beer, imported direct or taken out of bond by, and for the sole use of, Commissioned Officers serving on full pay in the regular Military or Naval forces of His Britannic Majesty, subject to such regulations as the Customs may make for the due protection of the revenue, provided that if any such liquors shall be sold or otherwise disposed of to or for consumption by any other person not legally entitled to import the same free of duty without the duty being first paid thereon to the Customs according to the tariff then in force, then they shall be forfeited, and the parties knowingly disposing of such liquors or into whose possession the same shall knowingly come shall be liable to such penalties as may be prescribed by law; and provided further that until otherwise enacted articles commonly known as 'canteen stores' imported or taken out of bond for the sole and exclusive use of His Majesty's Military Forces may, under the foregoing conditions, be admitted free of duty."

2. The Customs duties on goods imported from or through the colonies of the Cape of Good Hope or Natal, destined for places in the Transvaal other than the towns of Pretoria and Johannesburg, shall be paid to the collectors of Customs of those colonies, who have been nominated and appointed to act as agents for the collection of such duties. Goods destined for Pretoria or Johannesburg shall be duly entered and duty thereon shall be paid on arrival in accordance with the laws and regulations of the Customs.

3. The permits mentioned in section 1, sub-section (a), shall be issued subject to such conditions as may from time to time be prescribed by the said Military Governor of Pretoria.

4. Any goods imported as aforesaid without payment of the proper Customs duties or contrary to the regulations mentioned herein shall be liable to confiscation, and the importer or his agent shall in addition be liable to a fine not exceeding five times the amount of the Customs duties thereon, or, in default of payment, to imprisonment with or without hard labour for a period not exceeding twelve months.

5. This Proclamation shall be read together and with the Customs law of the Transvaal.

GOD SAVE THE KING.

INDIA.

DECISION REGARDING GENERATORS FOR MAKING SODA-WATER.—Customs circular (No. 1 of 1902) contains a Decision to the effect that generators for making soda-water, which are worked by steam power and are not adapted for working by manual or animal power, are exempt from duty under entry No. 14 of Schedule IV. of the Indian Tariff Act 8 of 1894.

FOREIGN COUNTRIES.

Chile.—ABOLITION OF IMPORT DUTIES ON PROVISIONS FOR VICTUALLING SHIPS.—According to the French *Moniteur Officiel du Commerce* of the 23rd January, the Chilean Government has abolished the import duty on provisions and eatables destined for use on ships. This applies to trading vessels, whether foreign-going or engaged in the coasting trade, as well as to Chilean and foreign men-of-war.

France.—IMPORT DUTIES ON "COLONIAL PRODUCE."—With reference to the French import duties on "colonial produce," the Board of Trade have received a copy of a despatch from H.M. Ambassador at Paris, reporting that a Bill to suspend the application from 24th ult., of the maximum tariff to British "colonial produce" has been passed by the French Chamber of Deputies, and is now before the Senate. Should this Bill become law, "colonial produce" of British Colonial origin will continue to be admitted into France at the rates of duty hitherto in force.

France (San Salvador).—COMMERCIAL CONVENTION BETWEEN THE ABOVE COUNTRIES.—The French *Journal Officiel* for the 29th January contains the text of a Commercial Convention concluded between France and San Salvador on the 9th January, 1901, and ratified at Paris on the 15th January, 1902. According to this Convention, "colonial produce" of Salvadorian origin will be admitted into France, Algeria, Tunis, and French colonies and possessions at the lowest rates of duty applicable to similar products of any other foreign origin. Reciprocally, goods of French or of French colonial origin are to be admitted into San Salvador at the lowest rates of duty applicable to similar goods of any other foreign origin, and the rates of duty on imports from France are to be lowered in respect of a number of articles specified in a schedule annexed to the Convention.

The text of the Convention, together with the lists of articles with respect to which concessions are made on either side, may be seen by those interested on application at the Commercial Intelligence Branch of the Board of Trade, 50, Parliament-street, S.W., any day between the hours of 10 a.m. and 5 p.m.

Guatemala.—IMPORT DUTIES: PROPORTION PAYABLE IN GOLD.—A memorandum prepared by H.M. Vice-Consul at Guatemala draws attention to the fact that, although the exact Tariff rates of import duty, without abatement or surtax, are now nominally leviable, the regulation which requires 30 per cent. of the duties to be paid in gold certificates is still in force. The effect of this regulation is practically equivalent to a surtax of 60 per cent. on the nominal Tariff rates, gold certificates being accepted by the Government at a premium of 200 per cent.; but the Vice-Consul adds that this rate, although maintained by the Government without modification for over two years, is subject to alteration at any time, the actual premium on gold being considerably higher than the rate mentioned.

Portugal.—TEMPORARY IMPORTATION OF ARTICLES INTENDED FOR CONSUMPTION OR REPAIR.—The Portuguese *Diário do Governo* for the 13th September last contains a Royal Decree authorising the temporary importation into Portugal, free of duty, of articles intended for consumption or repair.

Russia.—CUSTOMS DECISIONS.—The following Decisions with regard to the classification of articles under the Russian Tariff have been issued in recent circulars of the Russian Customs Department:—

Tariff classification of "lithopone."—The white paint known as "lithopone," consisting of sulphate of baryta and sulphuretted zinc, is dutiable under Section 137 of the Tariff, at the rate of 4 roubles 50 copecks per pound (£1. 9s. 7d. per cwt.), with the addition of the surtax of 10 per cent. laid down by the Imperial Ukase of the 5th August, 1900.

Articles manufactured of wood, with ornamental parts (not being essential trimmings) of leather or of textile material, are dutiable under Section 61, point 4, of the Tariff, at the rate of 15 roubles per pound (£4. 18s. 6d. per cwt.), with a surtax of 10 per cent., as mentioned in the preceding paragraph.

Machines and apparatus not specially mentioned, composed of various ordinary materials, if they contain no iron or steel, or contain either in insignificant proportions only (as bolts, joints, etc.), are dutiable according to the material of which they are made. If they are composed of various ordinary materials (other than copper and its alloys), but contain iron or steel (except in the form of bolts, etc.) in any proportion, they are dutiable at the conventional rate of 2 roubles 10 copecks per pound (13s. 9d. per cwt.).

Periodicals in the Polish language are free of duty under Section 178, point 3, of the Tariff.

Medical and pharmaceutical preparations not mentioned in the list of preparations authorised to be imported into Russia. Applications for leave to import these articles must be accompanied by two samples for examination. If imported in special packages, with labels and descriptions, the samples must also be accompanied by these labels and descriptions.

United States.—CUSTOMS DECISIONS.—The following is a list of some Decisions affecting the application of the Customs Tariff and Customs Regulations of the United States, which have recently been published by the Treasury Department at Washington:—

Hall-marked silver.—The goldsmiths' hall-mark placed on unfinished silver goods of domestic manufacture re-imported into the United States after being sent to the United Kingdom to be hall-marked, does not constitute an improvement in condition of the goods or advancement in value abroad within the meaning of para. 483 of the Tariff. Such goods may, therefore, be re-imported free of duty.

Spangled articles.—Ornaments, trimmings, and other articles, composed in part of spangles made of gelatine, are dutiable as "articles made in part of spangles," under para. 408 of the Tariff at the rate of 60 per cent. *ad val.*, and not under para. 450 as "articles made in chief value of gelatine."

Marble statuary, shown by proper certificates to be the professional production of recognised sculptors in the country of production, is dutiable as "statuary" under para. 454 of the Tariff at the rate of 20 per cent. *ad val.*, and not under para. 115 as manufactures of marble.

Scouring bricks, prepared from ground pumice stone and sand, mixed and pressed into different sizes, are dutiable as "pumice stone wholly or partially manufactured," under para. 92 of the Tariff, at the rate of \$6 per ton.

Finished articles of cotton cloth, such as couch covers and horse blankets, with whipped, hemmed, or stitched edges, made wholly of cotton, come under the definition of "cotton cloth" given in para. 310 of the Tariff, as consisting of "all woven fabrics of cotton in the piece or otherwise," and are, therefore, dutiable under the "countable clauses" of the Tariff, and not under para. 322, as "manufactures of cotton, not specially provided for."

Cotton glove material, made on the "Milanese machine," resembling knit goods in appearance, and of which the threads cannot be counted by unravelling or other practical means, is dutiable under para. 322 of the Tariff as a "manufacture of cotton, not specially provided for," at the rate of 45 per cent. *ad val.*

TRANSPORT AND FREIGHTS.

The Freight Market.—Outward rates are weaker, with the exception of Mediterranean Ports, which, owing to a combination of circumstances, have improved 3d. to 6d. Last Welsh fixtures have been on basis of 5s. 9d., Genoa; 4s. 6d., Malta; 6s. 6d., Adriatic; 5s. 9d., Constantinople; 5s. 6d., Port Said; 9s. 6d., Monte Video; 9s. 3d., Colombo; 15s. 6d., Mauritius; 16s. 6d., South Africa. **American** markets continue weak in all directions. **Australia** quiet. Recent fixtures have been on basis of 60s. hay to South Africa; 6s. to 6s. 6d. time charter foreign trades; 7s., Colonial register. Newcastle paid 9s. Singapore. **Black Sea** dull. Odessa rate has fallen to 8s. berth, 9s. 6d. charter. **Eastern** markets have been well maintained all round, and Rangoon has improved 2s. 6d., last fixtures having been on basis of 23s. 9d. **Mediterranean** markets continue in a state of stagnation. **River Plate** weaker. San Lorenzo down to 16s. 6d.—WEDDEL, TURNER & CO., London, 25th February, 1902.

UNITED KINGDOM.

Dover.—The new Prince of Wales Pier at Dover, which has cost over half-a-million sterling, was completed last month after having been nine years in construction. The pier forms the new commercial harbour, which encloses an area of seventy-five acres.

COLONIES.

Bermuda.—NEW FLOATING DOCK.—On the 8th February last, C. S. Swan & Hunter, Limited, of Wallsend-on-Tyne, launched a large floating-dock, which has been built to the order of the Lords Commissioners of the Admiralty, to be placed in the Government Dockyard at Bermuda, where it will replace the old floating-dock that has been there since 1869, and which has now become obsolete. The present dock is 545 feet long, and, having no gates, the length of ship it can take is not restricted; its clear width of entrance between rubbing fenders is 100 feet. Its lifting power up to the pontoon deck level is 15,500 tons, but by utilizing the shallow pound this can be increased to 17,500 tons, and the walls are of sufficient height to allow of a vessel drawing 32 feet to be taken on 3 ft. 6 ins. keel-blocks. The present dock is of the type known as a floating graving-dock, the invention of Messrs. Clark & Standfield, from whose plans it was built. The dock will have to lift the line-of-battle ships of 15,000 tons displacement with a length of bearing keel of 343 feet, but in addition it has to deal with cruisers of the *Terrible* class of about the same displacement, but with 383 feet of bearing keel, and lastly auxiliary cruisers like the *Campania*, weighing some 17,000 tons, with a bearing length of keel of 502 feet.

Canada.—STEAMSHIP LINE TO SOUTH AFRICA.—A *Reuter* telegram, dated Ottawa, February 13, states that the Dominion Parliament was opened on that day by Lord Minto, Governor-General. In his speech from the throne His Excellency said: I have pleasure in informing you that the Governments of Australia and New Zealand have accepted the invitation of my Government to attend the conference in London in June for the consideration of trade, transportation, cable, and other matters of intercolonial concern, and it is hoped that the meeting will lead to the extension of Canadian trade with those important portions of His Majesty's dominions. I have further to advise you that the Government, having caused an enquiry to be made, has reached the conclusion that the establishment of a direct steamship line with South Africa will enable Canada to secure in that country a profitable market for her varied products, and that it will endeavour to arrange such a service.—During next season the Canadian Forwarding and Export Company intends to run a regular fortnightly service of steamers between Rotterdam and Montreal, to commence in the middle of April.

FOREIGN COUNTRIES.

Brazil.—RIO JANEIRO HARBOUR IMPROVEMENTS.—The Brazilian Government issued a decree on the 6th November sanctioning the formation of the "Companhia Docas do Rio de Janeiro," and some particulars on the subject are furnished to the *Hamburgische Börsenhalle* by its correspondent at Sao Paulo. This Company, it appears, has been created by the fusion of two companies each of which had obtained the privilege of constructing and working quays in the harbour of Rio de Janeiro, namely, the Empresa Industrial de Melhoramentos do Brazil, and the Rio de Janeiro Harbour and Docks Company. Hitherto these two companies have been bitterly antagonistic, to the prejudice of the work they were supposed to forward, and the fusion now effected is expected to result in a great impetus to the carrying out of the quay improvements as planned. It is estimated that a capital amounting to 150,000 contos of reis will be required for executing the works, the undertaking being therefore a gigantic one. The privileges granted to the new concern are somewhat greater than those accorded to the Santos Quays Company. The tariff at Santos will be taken as the basis of that of the Rio Quays Company as regards the dues to be levied for the mooring, discharging, and loading of vessels, and the storing of merchandise in the warehouses, but in addition to these charges the privilege of levying a tax not exceeding 2 per cent. of the value of goods imported into Rio for the period of forty years, dating from the 1st January, 1902, is granted to the Rio Company, as an equivalent of 6 per cent. interest on the capital invested, and for maintenance and general expenses. A sinking fund has also to be provided on the basis of a redemption within the period of sixty-nine years. The hope is indulged in that the projected new quays may be completed within ten years from the present time, and then it is estimated that the profits realised will render it possible to pay interest at the rate of 8 per cent. on the capital of the Company. Besides the ordinary income from shipping operations, large profits are expected to be made from the sale of valuable building plots, formed by the draining and filling in of ground contiguous to the quays. It is quite possible, in the present condition of Brazilian finance, that some of the capital may be sought for on this side of the Atlantic.—*Fairplay*.

Madagascar.—TUGS AT TAMATAVE.—The Consul-General for France is informed by the French Ministry of Commerce, that the Société du Wharf de Tamatave, Madagascar, has now, for the service of that port, two tugs—the *Alsace* of 100 horse-power, and *Lorraine* of 50 horse-power. In signalling for a tug the pilot flag should be hoisted under the national one. The above information is of the highest interest, as it appears that a recent wreck might have been avoided if the captain had been acquainted with the signal.

New York and the Levant.—The new direct steamship line between New York and the Levant, established jointly by the Hamburg-American Company and the German Levant Line, is already in operation. The first boat (the Levant steamer *Seriphos*) left New York with a full cargo on the 7th ult., and the next to follow will be the Hamburg-American Line boat *Sicilia*. The ports to be included in this direct homeward service are Malta, Alexandria, the Piræus, Smyrna, Constantinople, Novorossisk, and Odessa. The first voyage from the Levant to America is announced for the 20th March, starting from Odessa, and the boat will call at Constantinople, the Piræus, Patras, Malta, and Algiers—Beyrout and Alexandria will be included later on.

Russia.—A NEW RAILWAY FROM ST. PETERSBURG TO ODESSA.—The Odessa correspondent of the *Times* writes under date February 4:—The question of establishing a new line of railway joining St. Petersburg and Odessa and coinciding as nearly as practicable with the 30th parallel of longitude E. has occupied the attention of the Russian Minister of Ways and Communications, Prince Khilkoff, for many years past. According to the latest advices, there seems good ground for concluding that the decision of the Russian authorities will shortly be given in favour of the construction of this railway, which will be known as the St. Petersburg-Kieff-Odessa Southern Trunk Line. The new line will not only effect a very considerable saving in the journey between the northern and southern capitals of the empire, but will open up many vast and wealthy grain and mineral areas at present either served inefficiently by the existing railways or not served at all. Both from the commercial and the strategical point of view such a trunk line of *minimum* length will possess advantages for Russia difficult to over-estimate.

OFFICIAL AND COMMERCIAL CONTRACTS. UNITED KINGDOM.

Bournemouth.—TENDERS are invited, until the 8th inst., for TRACTION and ARC LIGHTING SWITCHBOARDS. Particulars (£3. 3s.) may be obtained from F. W. Lacey, borough engineer, Municipal Offices, Bournemouth.

Colchester.—TENDERS are invited, until the 6th inst., for the SUPPLY and DELIVERY for twelve months of York curbing, granite cubes, broken granite, broken Kentish ragstone, Kentish sifted red flints, Portland cement, glazed stoneware sewer pipes, from 24 in. to 4 in., with junctions, bends, traps, taper pipes, and gullies. Particulars may be obtained from Herbert Goodyear, borough engineer and surveyor, Colchester.—TENDERS are also invited until the 6th inst., for the SUPPLY of about 450 tons of the best hand-picked Buxton or Derbyshire stone LIME, to be delivered at the rate of about 9 tons per week. Particulars as above.

Ilkeston.—TENDERS are invited, until the 27th inst., for the CONSTRUCTION of a PUMPING STATION. Particulars (£10. 10s.) may be obtained from Messrs. G. and F. W. Hodson, Loughborough.

London.—The London County Council invite TENDERS, until the 11th inst., for the SUPPLY, DELIVERY, and ERECTION of a 10-ton OVERHEAD TRAVELLER. Particulars (£1) may be obtained from the Engineer's Department, County-hall, Spring-gardens, S.W.

Oban.—TENDERS are invited, until the 7th inst., for the SUPPLY and ERECTION of (4) steam, exhaust, drain, and other pipes, pumps, condensing plant, etc.; (5) balancing transformers and motor generators; (6) storage batteries; (7) switchboard; (8) are lamps, incandescent lamps and fittings; (9) cable work; (11) travelling crane. Particulars (£2) may be obtained from Burstall and Monkhouse, 14, Old Queen street, Westminster.

Swansea.—TENDERS are invited, until the 8th inst., for the SUPPLY, DELIVERY, and ERECTION of two 600-k.w. continuous-current STEAM DYNAMOS, together with condensing plant, steam and exhaust pipes, and valves. Particulars (£3. 3s.) may be obtained from Mr. C. A. L. Prusmann, Electricity Works, Swansea.

Tynemouth.—TENDERS are invited, until the 18th inst., for the CONSTRUCTION of a GRAVITATION MAIN, consisting of 12½ miles of 18-in. cast-iron pipes from Stanington to Tynemouth. Particulars (£5) may be obtained from Mr. James Mansergh, 5, Victoria-street, Westminster.

COLONIES.

New South Wales.—The Government of New South Wales are prepared to grant a concession of a 99 years' lease of a suitable floating-dock site at the port of Newcastle, N.S.W., to any responsible owner or company undertaking to build, equip, and maintain a floating-dock suitable for accommodating vessels up to 5,000 gross tonnage. Tenders to be addressed to the Under-Secretary for Public Works, Sydney, and to be delivered in Sydney up to the 7th April, 1902. Particulars may be obtained at the office of the Agent-General for New South Wales, 9, Victoria-street, Westminster, London, S.W.

Queensland.—The Municipality of Rockhampton invite TENDERS, until the 31st inst., for the CONSTRUCTION of an ELECTRIC TRAMWAY SYSTEM complete. Particulars may be obtained from Mr. H. E. Bellamy, the city engineer.

South Australia.—TENDERS will be received at the Supply and Tender Board Office, Adelaide, up till the 16th April, for the SUPPLY of the following MATERIALS, delivered in bond, on wharf, Port Adelaide, wharfage to be paid by the contractor:—

- 12 mild steel boiler plates.
- 17 mild steel smokebox tube plates for flanging (five drawings, 1s. each).
- 4 mild steel firebox back casing plates for flanging (two drawings, 1s. each).
- 8 mild steel firebox throat plates for flanging.
- 17 copper tube plates for flanging (four drawings, 1s. each).
- 4 copper wrapping plates.
- 329 engine and tender tyres (ten drawings, 1s. each).
- 500 carriage and wagon tyres (one drawing, 1s.).
- 24 metal water-closet pans (one drawing, 1s. 6d.).
- 24 metal folding lavatories (one drawing, 2s.).
- 2 No. 6 Stow flexible shafts.
- 1,000 indiarubber draw springs (one drawing, 1s.).
- 50 indiarubber hose pipes (one drawing, 1s.).
- 12 bars channel steel (one drawing, 1s.).
- 20 bars Yorkshire angle iron (two drawings, 1s. each).
- 156 firebricks for gas furnaces.
- 760 bronze flexible unscrewed firebox stays.
- 32 bars of stay bolt metal.
- 500 indiarubber washers for hose pipe couplings.
- 750 compound indiarubber washers.
- 1 ton "Damascus" metal.
- 4 cone bearing inspectors or journal jacks.
- 2 circular best Yorkshire iron plates.
- 4 ball-bearing ear jacks.
- 200 plain indiarubber washers.
- 2 best steel crank axles (one drawing, 5s.).

Particulars may be obtained at the above office, and the office of the chief mechanical engineer, Islington, Adelaide, and also at the office of the Agent-General for South Australia, in London, 1, Crosby-square, E.C.

INDIA.

Bombay, Baroda and Central India Railway.—TENDERS are invited, until the 5th inst., for the SUPPLY of the following STORES:—(a) Fish bolts, spikes, spring steel, rails; (c) crossings. Particulars (a, 21s. each; c, 5s. each) may be obtained at the offices, Gloucester-house, Bishopsgate-street-without, E.C.

Calcutta.—The Commissioners of the Corporation Water-works invite Tenders, until the 23rd April, for 10,000 STOPCOCKS, as follows:—1,428 inch, 2,856 three-quarter inch, 5,716 half-inch; delivered c.f.i. Calcutta. The stopcocks are to be a strong pattern, gun-metal, with loose valve, square head on spindle, and a false spindle not less than ½ in. square on all sides. Stops to have male ends screwed for iron pipe. Tenders to be addressed to the vice-chairman, at the Municipal Office, Calcutta.

FOREIGN COUNTRIES.

Argentine Republic.—TENDERS will shortly be called for by the Argentine Government for the EXTENSION of the Buenos Ayres DOCKS. Particulars respecting the conditions of tender may be seen at the Commercial Department of the Foreign Office.

Belgium.—TENDERS are invited, until the 26th inst., by the National Company of Local Railways, at No. 14, Rue de la Science, Brussels, for the CONSTRUCTION of the SECTION of the LINE from Moustier to Bouvignies on the RAILWAY from Tournai to Ath. The upset price of the work is 190,894.96 francs (£7,635. 16s.), and a deposit of 19,000 francs (£760) is required. Particulars (10d.) may be obtained at the company's offices, and at the office of M. Dolmans, No. 104, Avenue de Maire, Tournai.

China (Shanghai).—The ratepayers of the international settlements at Shanghai have voted in favour of establishing a SYSTEM of TRAMWAYS in that city, and the Council has invited TENDERS, until the 7th inst., for the CONSTRUCTION and OPERATION of such a system.

Cuba.—TENDERS are invited by the United States Government for the CONSTRUCTION of a PIER, FREIGHT HOUSE, ETC., at Matanzas, to cost about \$200,000. Particulars may be obtained of the United States engineer at Matanzas. Contract closes March 8.

Egypt.—The Administration of the Egyptian State Railways invites TENDERS up to the 16th inst. for the SUPPLY of 360,000 PINE SLEEPERS, in lots of 20,000 each. Particulars (2s.) may be obtained from Lieut.-Colonel J. H. Western, R.E., C.M.G., Broadway-chambers, Westminster.—TENDERS are also invited by the Egyptian State Railways Department, up to the 16th inst., for the SUPPLY of CARRIAGE TRIMMINGS. Particulars (2s.) may be obtained at the offices of the inspecting engineer, Lieut.-Colonel J. H. Western, R.E., C.M.G., Broadway-chambers, Westminster, S.W.

Russia.—Prizes of 5,000 roubles, 3,000 roubles, and 1,000 roubles are offered for the best AUTOMATIC COUPLING APPARATUS for railway cars. Foreigners, as well as Russians, may take part in the competition. The final date for the presentation of plans is fixed for the 15th April, 1903. They should be addressed to the Congress of the Representatives of Russian Railways, St. Petersburg, Nevsky 30.

Siam.—TENDERS are invited by the Siamese Government, to be received not later than April 1, for the supply of ROLLING STOCK for the Siamese State Railways. Particulars at the Commercial Department, Foreign Office.

Spain.—The Port Works Committee at Barcelona invite TENDERS, until the 10th inst., for the SUPPLY of a STEAM TUG. A provisional deposit of 2,000 pesetas (£77) is required to qualify any tender.—The Ministry of Marine, Madrid, require a SUPPLY of GUNPOWDER and MAUSER CARTRIDGES for the fleet for two years. No date for closing contract is stated.—TENDERS are invited, until the 7th inst., for the INSTALLATION and WORKING for 15 years of ELECTRIC LIGHT in the "Careel Modelo," Madrid, no result having apparently followed the previous call. The upset price is 40,000 pesetas (about £1,173) per annum, payable in monthly instalments. A deposit of 2,000 pesetas (£59) is required to qualify any tender. Particulars are given in the *Gaceta de Madrid*.—TENDERS are invited, until the 15th inst., for the SUPPLY of COAL and IRON to the committee of the "Maestranza de Artillería" of Sevilla during the fiscal year 1902, as follows:—1,500 metric quintals of foundry coal at the upset price of 4.95 pesetas per metric quintal, 3,000 metric quintals of machine coal at the upset price of 5 pesetas per metric quintal, 9,000 kilogs. of angle-iron, T's, double T's, rails, etc., at the upset price of 50 cents per kilog., 3,500 kilogs. of iron plates at 60 cents per kilog., and 60,000 kilogs. of bolt, bar, and plate-iron at 45 cents per kilog. Particulars may be seen at the Maestranza.—TENDERS are invited, until the 14th inst., for the SUPPLY of PLUMBAGO CRUCIBLES to the Spanish Mint during the years 1902, 1903 and 1904. The sizes and quantities (expected) required are as follows:—4,000 crucibles No. 60, 3,600 crucibles No. 50, 600 crucibles No. 35, 2,100 lids No. 60, 1,800 lids No. 50, 300 lids No. 35. Particulars may be obtained in the office of the *Fabrica Nacional de la Moneda y Timbre*, Madrid.

COMMERCIAL LAW INTELLIGENCE.

Shipowners' Lien for Freight.—In the King's Bench Division on the 10th ult., Messrs. TAGART, BEATON AND CO. sued Messrs. FISHER, of Barrow, for £1,000. Plaintiffs were agents for the sale of timber shipped by Messrs. Baars, Dunwoody and Co., who, on the 29th May last, sent plaintiffs bills of lading for a quantity of timber valued at £3,867, shipped in the *Askehall* (s.), the freight being payable by the consignees. The bills of lading stated that £3,750 had been advanced against the freight at the port of shipment, so that the value of the goods with the paid freight amounted to £7,617. Against this sum Messrs. Baars had drawn on plaintiffs for £6,000, plaintiffs to sell the goods in the ordinary way. At the same time a freight note for £1,000 signed by the captain and dated 27th May was also sent, which stated "Five days after arrival at port of destination of the *Askehall*, of which I am master, I promise to pay to the order of myself £1,000 value received for account of freight on cargo now on board my said vessel, payable under terms of charter dated 15th May, 1901. And for the payment of this note I pledge my said freight, and the consignees of my cargo and my agents are hereby directed to pay the amount of this obligation from the first amounts due for freight." This note was endorsed "pay Tagart, Beaton & Co., or order." On the 9th July, plaintiffs sold the timber and the vessel was ordered to Barrow. The duty of superintending the delivery of the cargo, and collecting as much freight as remained payable in England, was placed in defendants' hands. They knew that they had to collect £1,635, of which £1,000 was to be used in redeeming the captain's note, and the balance was to be accounted for to Messrs. Baars's agent. On the 15th July, plaintiffs gave defendants notice that they were the holders of the note, which notice was acknowledged by defendants on the 16th July. On the 19th July the *Askehall* arrived at Barrow, and the discharge began on the 20th. On the 26th July the note was presented, but defendants not having collected any freight refused payment. On the 3rd August, defendants had ample funds in hand to pay the note, but in the meantime (on the 1st August), the owners of the vessel, the West Hartlepool Steam Navigation Company, had telegraphed defendants not to pay

either captain or time-charterers' drafts out of freight, but to hold same for their account and at their risk. It appeared that the owners had chartered the vessel to Messrs. Baars for three years, by a charter-party dated 6th October, 1900, and a month's hire in advance was due on 2nd August at noon. On the 1st August a formal notice of the alleged lien for chartered hire was served on defendant on behalf of the owners. The question to be decided was whether defendants, who have sufficient funds in hand to meet the note, are bound to pay plaintiffs. His Lordship (Mr. Justice Bigham), in giving judgment, said that he did not think that under the circumstances defendants could deny plaintiffs' title. They received the money under an authority from Messrs. Baars' agent, and with his consent they undertook with plaintiffs that if plaintiffs would forward the note to them for payment they would meet it out of the money to be collected. It appeared to him that having entered into a binding promise to pay, they ought to pay, notwithstanding the shipowners' intervention. When the owners intervened, defendants had, he said, become trustees for plaintiffs of so much of the £1,000 already paid by the consignees as would be left in their hands after payment of their own charges, and they were bound to hold any further freight they might subsequently receive subject to the same trust. Although the captain said in the note that he had received £1,000 on account of freight, he had received nothing, and when plaintiffs received the note they only got the time-charterers' right to receive the £1,000, a right which was subject to the shipowners' lien. But before the lien could be exercised (there being then no chartered freight payable) £1,000 of the bill of lading freight had been paid to defendants, who, for the purpose of the receipt of the money, stood in the position of the time-charterers themselves, and no lien could afterwards be exercised on that sum. And as to the balance which was paid on 3rd August, this also, he held, reached the constructive possession of the time-charterers before any lien was exercised, for a notice of the existence of the lien served on defendants was of no value; it ought, in order to become operative, to have been served on the persons who had to pay the freight, not on those who were receiving it for the charterers. He gave judgment for plaintiffs for £1,000, less any moneys which might be due to defendants for disbursements. Leave to appeal was granted.

Stockbrokers' Liability.—*OLIVER v. BANK OF ENGLAND* (STARKEY, LEVISON, AND COOKE, third parties) was an appeal against an order made by Mr. Justice Kekewich, under which Mr. W. J. Starkey, a member of a firm of stockbrokers, was made liable to indemnify the Bank of England against loss through the sale of certain Consols. Sir Robert Reid, K.C., who appeared for the appellant, said that Mr. Edgar Oliver took an action against the Bank of England to recover the value of certain Consols and Bank stock, which had been sold under a power of attorney to which the plaintiff's signature had been forged, obtaining judgment against the bank. Mr. Edgar Oliver was a co-trustee with his brother, Mr. Frederick Oliver, since deceased. The latter had admittedly forged Mr. Edgar Oliver's signature to the power of attorney under which the appellants had acted. The bank counterclaimed against Messrs. Starkey, Leveson, and Cooke, and obtained judgment. This was the first time that a stockbroker had been made liable under such circumstances. Counsel contended that the bank authorities, who had the signatures of the trustees, had not made sufficient enquiries before transferring the shares to the appellants under the power of attorney. Lord Justice Vaughan-Williams: In certain cases third parties are not liable. For instance, if you go to Victoria Station and, seeing a gentleman standing by a train, ask him if it goes to Brighton and he says yes, but it does not, you cannot take an action against him. Again, if you ask a policeman wearing the company's uniform the question and he says yes, and you go wrong, you cannot take an action against the company, because he is not authorised to give such information, but you could take an action against the policeman for misleading you. (Laughter.) Sir Robert Reid assumed that it would be the duty of the man, not only to the passenger but also to the company, to tell the truth and say which was the correct train. In this case the bank made its own enquiries. The authorities had the signatures and probably had signed dividend warrants. Both the appellants and the bank had been misled. The bank, he submitted, had every opportunity for making enquiries, while Mr. Starkey had no such opportunity. Lord Justice Vaughan-Williams, without calling upon Mr. Green, K.C., for the respondents, said that the brokers, upon presenting the power of attorney at the Bank of England, demanded that the authorities should effect the transfer of the Consols and Bank stock in question. And the Bank of England did so. The sole question to be decided was whether or not, as the law stood at the present moment, there was raised by implication of law a warranty by the brokers upon the authority on which they demanded the bank should act. The brokers purported to act as agents of both the gentlemen, Mr. Edgar and Mr. Frederick Oliver. His Lordship was of opinion that the law did raise an implied warranty as against the brokers. The arguments of Sir Robert Reid and Mr. Upjohn were most interesting, but his Lordship thought that the learned counsel invited the Court to deal with questions which were not raised in this case. Indeed, most ingenious propositions had been put before the Court. He thought that the judgment of Mr. Justice Kekewich must be affirmed. Lords Justices Stirling and Cozens-Hardy concurred, and the appeal was dismissed, with costs.

BRITISH CONSULAR REPORTS.

Brazil (Sergipe).—The State of Sergipe is separated from the Northern portion of Bahia by the River Real, and has an area of 26,000 square miles; the chief port is Aracaju. In the Consular report, recently received, on the condition of Sergipe for the year 1900, it is stated that the imports amounted to 4,062,992 milreis (£203,150), in addition to those goods which entered the State overland, and which are valued at £150,000. Dried meat, flour, petroleum, cement, coal, wine, hardware, machinery, cotton goods, and boards were the chief articles imported. Aracaju, the capital of the State, contains 20,000 inhabitants, and a few fair shops. Near the town there is a cotton mill with 5,100 spindles and 156 looms; 400 hands are employed, spinners being paid 9d. and weavers 1s. 6d. per day. No night work is done, but the working days average 300 in the year, and 300 pieces of white calico (of 30 metres each) are turned out daily; the hands work ten hours daily. Every piece of this machinery, mill fittings, looms and spindles, came from Lancashire, the dyed yarns from Manchester, and the steam coal from Cardiff. The owners of the mill and the manager are Brazilians, and they assured me that they could not wish for better goods than we supplied them with, and appeared highly satisfied with British work. A smaller cotton mill is running near the town, and employs water power. There are 3,000 spindles and 150 looms, and the working days average 200 yearly. The machinery, spindles, etc., all came from America, Germany and France. An inspection of the shops in three of the chief towns of Sergipe gave the following results:—Germany supplies zinc sheets, metal pans and pots, cheap chains for hammocks, door locks, and cheap cutlery. The United States supply petroleum, most of the galvanised barbed wire, hoes

and hatchets, and a few cheap tools. The United Kingdom sells coals, steel tools (with the exception of files), screws, barbed wire, cutlasses, cutlery, iron roofing, hoe heads, knives, strong kettles, bar steel, shoe tacks, blacking, ink, and ready-made paint in tins. It was further noticed that cotton goods were almost exclusively from Manchester (when not of native make), but "zephyrs" came from France, and shawls from Germany and Austria, whence also comes the writing paper. In general, we may be said to secure a fair portion of the trade, but the Americans are ousting us from the market in barbed wire, and the Germans own all the trade in shawls, two very important articles. The Consul recommends those British houses who deal with either Bahia or Pernambuco to instruct their agents to watch this market closely. Sugar and cotton prices will some day rise, and then, with more money, there will be better trade, and, unless we wake up, we shall find ourselves left behind. The only commercial travellers who visit Sergipe are Brazilians travelling for German or native firms. A few smart British travellers, who know Portuguese, are wanted, with orders to visit the capital and push British goods. A market lost is hard to regain, and our German and American competitors are, the Consul considers, more energetic than we are. There is not a single bank in the Capital, and reliable information respecting credits is not easily obtainable. The German sugar houses in Maroim keep their friends in Pernambuco and Bahia well posted, whereas we can only learn what these gentlemen care to tell us. The Consul suggests that one of the British banks in either of the above-named towns should appoint an agent in Aracaju, to whom British merchants could apply for necessary information.

Somali Coast.—In his report on the trade of the Somali Coast Protectorate for the year ending March 31, 1901, the Acting Consul-General says that it is as unpleasant as it is rare to have to record a decrease in the value of the trade of this district amounting to over 11 lacs of rupees (or £78,500 odd), or something like 13½ per cent. on the average of the last three years. This sudden check in the steady advance of trade must be attributed to two causes, both of which may fortunately be considered only of a temporary nature, and which may be reasonably expected to re-act favourably on the trade of future years. The presence of the rebel Mullah in the Ogaden country rendered it necessary, for political reasons, to suspend all trade between our ports and that country. Thus, for the greater part of the year one of our most valuable markets has been closed to our traders. There are good grounds for supposing that for this reason and the absence of other outlets there are considerable accumulations of trade commodities in that country, and that on the final suppression of the Mullah and the restoration of order these products will find their way rapidly into our ports, there to be exchanged for rice, dates, cloth and other necessities, the want of which must soon be seriously felt. Again, the abundance of rain and good grazing which this district has enjoyed last season, though adversely affecting trade for the time being, must inevitably tell favourably in the long run. The Somalis being enabled to live on their live-stock and its produce, are for the time independent of rice and other provisions. But at the same time their stock is increasing, and the surplus which they find themselves unable to maintain in dry seasons, when grazing is scarce, must sooner or later be exchanged for imported provisions and other necessities. It may not, therefore, be unreasonable to predict a return to normal figures next year. It has again to be recorded that the bulk of the trade of this district is in the hands of American firms having their business centres in Aden. They practically monopolise the whole of the skin trade and import the greater portion of the cotton piece-goods. A few British firms have furnished samples of their manufactures, but these do not compare favourably either in price or quality with the popular American grey shirting, which is still without a rival.

Uruguay (Montevideo).—CRISIS IN THE JERKED BEEF TRADE.—A Foreign Office report from H.M. Minister-Resident and Consul-General at Montevideo states that at the present moment the "saladeros," or dry salting establishments in Uruguay are passing through a somewhat critical period. Their chief product is jerked beef (tasajo or charque) which finds its principal market in Brazil. Of late the existence of large stocks of this article in the latter country has sent down prices to such an extent that there is but a small margin of profit for the manufacturers, and now the trade finds itself threatened with another danger in the shape of an increase in the Brazilian import duty. "Tasajo" has hitherto paid 25 reis per kilogram, but the Brazilian Customs authorities have now decided to treat it as "preserved meat," thus raising the duty to 100 reis per kilogram. The proposed increase has apparently not yet received the sanction of the Legislature, but it is believed in Montevideo that it will be passed, and the news has created a considerable amount of alarm not only among drysalters but also among stock raisers. The present crisis should be a lesson to the "saladero" owners, and should teach them not to depend exclusively upon the production of an article like "tasajo." In Europe it could never find a market, as not the poorest peasant would subsist on it. Uruguay is rich in cattle, and it seems strange that the greater portion of the meat should be used for a primitive article which can only be disposed of in certain markets. What science can do is shown by the results of Liebig's establishment at Fray-Bentos, and it should encourage the "saladero" owners to adopt improved processes and to endeavour to produce something suitable to the tastes of civilised communities.

FOREIGN CONSULAR REPORTS.

Milk Flour.—The United States Consul at Gothenburg reports a discovery by Dr. M. Ekenberg which will be of importance in dairy farming. He claims to have invented an apparatus by which milk can be brought into the form of powder, like flour in appearance, but possessing all the qualities of milk in concentrated form, moisture excepted. It is said that this milk flour is completely soluble in water, and can be used for all purposes for which common milk is employed. The milk flour does not get sour, does not ferment, and in the dry state is not sensitive to changes in the weather. It can be kept and transported in tin cans, barrels, bags, etc. The cost of production Dr. Ekenberg has estimated at about 27 cents per 100 quarts, and he thinks that flour made from skimmed milk can be sold for about 13 cents per pound. At a recent meeting of the Academy of Agriculture, Dr. Ekenberg exhibited samples of the milk flour, which received favourable comments. It is considered that the invention will be of the greatest importance for the utilization of skimmed milk, which heretofore has largely been wasted, but in the dry form can be transported all over the country without losing any of its original good qualities. The product mentioned is considered superior to the casein products "proton" and "proteide" now manufactured from milk by the aid of rennet, acid, or lye.

Openings for Capital in Australia.—The United States Consul at Newcastle, New South Wales, in noting the prohibitory nature of the new federated tariff, prophesies a decrease of importations, and sees in consequence an excellent opening

for capital. The Consul goes into details regarding the lines of goods which may be manufactured in the Newcastle district. Although he takes much for granted his remarks are nevertheless of interest. He states that glassware and crockery may be manufactured cheaply, while iron and steel are abundant, and the great deposits of ore are close to the coalfields. Materials for soap and candles are at hand, match factories would find a ready sale for their products, all classes of woollen goods could be produced at low rates, and it would pay to make gloves and hats along American lines. There is a large sale for washing machines, clothes wringers, and various laundry apparatus. A few agricultural implements are manufactured, but there is a good demand for American mowing machines, reapers, and binders. A factory making these machines would do well. There is no nail factory here, hence large quantities are imported from other countries. A rolling mill equipped to manufacture iron articles, from railroad iron or steel and bridge beams to kettles, would control the trade of this country, as well as that of the South Sea Islands. Materials for the manufacture of all kinds of paints are easily procured at a very small cost. Magnificent woods, susceptible of a high degree of polish, are plentiful. With a heavy tariff on paper, a modern mill would do well. Much paper is used, especially the cheaper sorts, such as wrapping and news paper. Such a thing as a modern paper bag, with corners folded, he has never seen in these colonies.

Rubber Output of the Amazon Valley.—The United States Consul at Para reports that at the close of 1901, the receipts of rubber at Para were nearly 30 per cent. greater than ever before at that season. Business was good in 1900, exchange low, and credits easy. The labourers and middlemen indulged in many luxuries. The end of the season found the crisis at hand, exchange rising rapidly, the gatherers deeply in debt, and the price of rubber reduced 20 per cent. Now they are making a desperate effort to pay off this indebtedness and make a fresh start. They are getting a large proportion of their food from the streams and forests by hunting and fishing; they are purchasing only absolute necessities; and are working overtime to increase the crop and liquidate their bills. It was reported in December that there were on the way down the river, from the upper tributaries of the Amazon, about 700 tons more rubber than had ever before been shipped from that section in one season, and that there were at least 200 tons more to follow. About 30 small steamers and launches left Para and Manaus for the Acre, Jurua, Purus, and Beni rivers, and were due to return to Para in February. Altogether, adds the Consul, there is reason to believe that this season's rubber crop will exceed that of last year by a very considerable margin.

Trade Prospects in Western Canada.—The United States Consul reports that London, Ontario, is developing a considerable trade with the North-West Territories, British Columbia, and the Yukon country. These are new and promising fields, and, since this city is easily reached, it might be well for manufacturers and dealers to gain access to these new markets. Fire- and paving-bricks of good quality are not manufactured in the Dominion, owing to a lack of suitable clay. A profitable trade might be established in this line, since it is a matter of daily consideration on the part of the cities and towns of this province how to replace the old cedar block pavement, which has proved so unsatisfactory.

CHAMBERS OF COMMERCE REPORTS.

UNITED KINGDOM.

Association of the Chambers of Commerce of the United Kingdom.—The official programme of the forty-second annual meeting of the Association of the Chambers of Commerce of the United Kingdom, to be held at the Whitehall Rooms, Hotel Metropole, on March 4, 5, and 6, under the chairmanship of Lord AVEBURY (the President), has been issued. The subjects that will be discussed include every topic of interest to the commercial world, and representatives will be present from Chambers of Commerce in every district of Great Britain and Ireland. On behalf of the London Chamber, a resolution will be submitted, to the effect that His Majesty's Government be urged, in the interests of commerce, that, before recognising transference of territory by any power, they should insist on the policy of the "open door," and should invite the co-operation of other States who are similarly interested with this country in maintaining existing rights. Recognising the importance of a trade route to China, the Liverpool Chamber will urge the adoption of the following resolution: "That this Chamber is of opinion that the Mandalay-Kunlon railway should be extended without delay to the frontiers of China, and that the project for the construction of a line or lines in connection therewith to Yunan and Szechuan should receive the diplomatic and financial support of His Majesty's Government and the Government of India; or, if any other way of approach by rail to the Chinese Provinces named be preferred by the British and Indian Governments, this Association would ask that a similar measure of support should be given to the contractors of any suitable railway by such route." The Halifax Chamber will suggest the appointment of a Royal Commission to consider the possibility of increasing and strengthening the trade relations between the different portions of the Empire. The Paris Chamber of Commerce will be represented, and will submit the following resolution in favour of the compulsory use of the metric system of weights and measures: "That, in the interests of British trade, the compulsory use of the metric system of weights and measures has become imperative." No fewer than three Chambers—Leeds, Edinburgh and Sunderland—have placed down resolutions on the subject of Parliamentary procedure, they desiring some reform which will facilitate the despatch of public business, and thus permit of legislation in the interests of commerce. Quite a number of postal and telegraphic matters are to be dealt with, the suggestions being made that telegrams should be cheapened; that underground wires should be adopted, so as to prevent the interruption and disorganisation of telegraphic communication; and that additional and improved cables should be established between the United Kingdom and the Continent.

Bradford.—At the monthly meeting held on December 29 Mr. Gustav Hoffmann was re-elected as president, and in his address he said that he should like to begin his second year of office with the emphatic assurance that the work of the Law Amendment Committee was only a fractional portion of the work of the Chamber, and that that work had always a most distinct and practical bearing upon the objects of the Chamber. The Chamber has been truly described as a Trade Vigilance Committee, and to all matters which affected the trade of the district the Chamber and its secretary had been fully alive. It was always their tradition to attach themselves to no particular industry or branch of trade; they looked at the trade of the district from a broad point of view, and never allowed themselves to deteriorate to the level of an employers' union. They were also a bureau of information. These statements he supported by giving instances of the Chamber's usefulness.

He did not propose to say anything of the position of trade and its prospects, for the simple reason that he was not qualified to do so, but he pointed out that there had been a decline in

the number of large bankruptcies in late years. This improvement he traced to the greater width and breadth of the trade basis, its greater elasticity and capacity to adapt itself to the needs of new markets and passing fashions. There was also the fact that the means of getting large credits for merely speculative transactions had been considerably constricted of late years. The diversity and elasticity of the trade he traced in turn to the better education of the workers and the leaders of trade.

The Chamber had always taken great interest in the growth and development of technical education, especially at the Bradford Technical College. Recently the Yorkshire College authorities had brought forward a scheme for the promotion of a higher technical or commercial education for the leaders or captains of trade. That movement he welcomed heartily, and the Chamber had supported it fairly well. The question was one of great importance, and would come before them still more frequently in the future. In Bradford they were capable of dealing with their own education, so far as it was purely technical, but they were quite willing to recognise that when it got beyond that mark, and became more of the college and University character, it was necessary to go to a college specially fitted for it—such as the Yorkshire College at Leeds. That college he should like to see placed upon a county footing as the basis of a Yorkshire University.

The minutes included those of a meeting of spinners, manufacturers, woolcombers, and general millowners in the Bradford district, held on January 14, to consider the desirability and practicability of starting all mills at the same time in the morning. A resolution was passed unanimously to the effect "that in the opinion of this meeting it is neither desirable nor practicable to start all mills at the same time, and that any future interference with the hours of labour by the Home Office is to be deplored."

Halifax.—The monthly meeting of this Council was held on the 29th December, the president (County Alderman J. W. Smithies) being in the chair. The president was re-elected, and Messrs. C. Holdsworth and J. H. Murgatroyd were re-appointed vice-presidents, all unanimously.

The Council cordially supported the suggestions of the Edinburgh Chamber in reference to the laying of main line telegraph wires underground, and expressed their willingness to join in the proposed deputation to the Postmaster-General on the subject.

It was reported that the United Committee of the Corporation, the Chamber of Commerce, and the Drapers and Hosiery Association had considered the letter from the National Telephone Company (Limited), of December 4, 1901, and could not recommend the Corporation to accept the terms offered by the company, but fully approved of the clause in the Corporation Bill, which is to confer powers to enable them to establish a municipal telephone. The action taken by the representatives of the Chamber in the matter was approved.

The Council resolved to petition Parliament in favour of the bill to amend the law relating to the rating of hereditaments containing machinery, and to ask the borough and county members to support the second reading of the bill.

A circular was read from the Huddersfield Chamber recommending that the Government be urged to increase the duties on German wines in the event of the German Tariff coming into operation. Mr. Firth moved a resolution approving of the principle expressed in this communication, but declaring that it did not go far enough. The resolution was carried. The Council also resolved to support the resolution before the House of Commons in favour of the appointment of a Minister of Industry and Commerce.

Leeds.—The annual general meeting took place on 29th December last, when the president, Mr. G. R. Portway, in moving the adoption of the report, said that during the past year the Chamber had applied to the Inland Revenue Office for increased stamping facilities in Leeds. Enquiries were at once instituted by the department, on whose behalf a gentleman came specially to Leeds, and within a very short time the application was granted. The concession would prove a great convenience to the city.

Considerable interest had been shown in the work of commercial education. Alderman Wurtzburg undertook to prepare a report on the present system so far as this district was concerned, and the report, for which they felt greatly indebted to Mr. Wurtzburg, was of great value. The authorities of the Yorkshire College had initiated a scheme for giving a course of higher commercial education. They asked for the assistance of the Chamber, and it was willingly given. The Chamber had obtained from a commercial community promises of about £200 for a term of three years, and their example had been an incentive to other bodies in the county. Bradford, he was glad to say, had obtained promises of a similar amount, and there was every prospect of the new course starting under very favourable circumstances. Another matter in which the influence of the Chamber had been felt, had reference to a trade dispute. The Leeds Cloth Pressers' Society brought under the notice of the Council a complaint with reference to the excessive length of worsted coatings which had to be manipulated by two men, and, as a result of the conference with the officials of the Society, they recommended the acceptance by the trade of a limit of 70 yards warp as the length of worsted coatings, the recommendation having been agreed to. There had been three discussions on the German tariff, but the subject had not yet been exhausted. Canal navigation, which was of great importance to the commerce of the country, had also occupied their attention, and a bill was being promoted for the formation of canal trusts and for the development of the waterways of the country.

Speaking of Parliamentary procedure, the President remarked upon the increasing influence and power of Chambers of Commerce with Government departments. The action of Chambers of Commerce had been distinctly felt in regard to underground telegraph wires. By the storm of a few weeks ago there was great interruption to telegraphic work. Several bodies addressed the Postmaster-General, and it looked from Lord Londonderry's letter as if the question was likely to be shelved. The Chambers again took the matter up. If the Press did not initiate the movement, at any rate it backed it up well. The result was a second letter from the Postmaster-General, the tone of it being very different from the first communication. They were told that the underground wire had been laid as far as Birmingham, and that the Post Office were going to push with all possible speed the work of connecting Liverpool, Manchester, and Leeds. In 1901 trade was not so easy to do as in the previous year, and prices were lower, yet there was only a falling off in our imports of £836,000 and in our exports of £6,028,000, the decline being accounted for by the difference in values.

Mr. J. Pente observed that they were all aware of the inability of the House of Commons, on account of present arrangements as to procedure, to satisfactorily deal with the subjects brought before its notice by Chambers of Commerce. There was no doubt that if the suggestion considered by the Chamber, on the initiative of the president, was put into operation, there would be a reform which would enable the House of Commons to carry out the wishes of Chambers of Commerce more effectively than they had been able to do in the past. With regard to the German tariff and the statement in the report that the Council "have not seen fit, having regard

especially to the export trade of this country, to recommend that retaliation should be resorted to," remarked that the subject of retaliation, directly or indirectly, had been considered by the Council and the committee appointed to consider the German tariff, and the action of the Germans would undoubtedly compel a greater amount of attention on the part of the commercial community to the question. The report indicated that we should have to look more to our colonies than we had hitherto done to make up for what had been taken from us through the operation of hostile tariffs. The time was coming when hostile tariffs would not be viewed in the light in which they had been regarded in the past.

Liverpool.—At a special meeting of the Liverpool Chamber on the 17th ult., Mr. G. H. Cox presided, in the absence of Sir A. L. Jones, when the subject of consideration was England's fiscal policy. Mr. Cox said that a very useful purpose might be served by a full and free discussion of the question, and even an attempt made to reach a closer understanding as to tariffs with their colonies. What he had seen and heard fully justified him in saying that protection was in the air, and it was most desirable that the subject should be ventilated. Bounties and subsidies were inimical to free trade and free exchange. They were justified in taking any necessary steps to restore freedom of exchange and to ensure, as Mr. Cobden said, that every source of supply was freely open to them. Mr. Alfred Bigland then read a paper on the subject indicated by the chairman. They should always be thinking of the future, he said, and not merely of to-day. He had drawn up a proposed contract with the colonies, in which he suggested there should be absolute freedom of interchange of all commodities, products, etc., as if the whole Empire were actually one great country. As this could not be done suddenly, it should be mutually agreed that the Government of every colony should for a term of years continue its present tariff, or a modification of it, but should in every item stipulate that goods grown or manufactured or obtained from any other part of the Empire should be admitted at half the fixed tariff. He further suggested the formation of a permanent council in London, with full colonial representation, to carry out the scheme. Councillor Austin Taylor concurred in what was said against bounties, but saw some difficulties. He elicited from Mr. Bigland the explanation that cotton and grain were not touched in his policy. Mr. A. Armour thought that Mr. Bigland's scheme would raise prices here, and would not be accepted in the colonies. Colonel Goffey said that he had been a free-trader all his life, but could not help seeing that in recent developments questions had arisen to necessitate reconsideration of the arguments held 50 years ago. No Englishman feared competition on fair and straight lines. How could any one meet the competition shipowners now had to meet? He referred to the bounties, for instance, the French Government gave to ships. British shipping could not fight against such competition. If the American Bill passed next year, all the energy and skill of British shipowners would not enable them to meet the Americans, backed up by an immense bounty and subsidy.

Manchester.—Mr. John Thomson, presiding at the annual meeting of the Chamber on the 5th ult., said that the future of the cotton trade looked more hopeful than it was a year ago. A discussion arose upon the following paragraph in the annual report of the directors, which referred to the new German tariff:—"Isolated suggestions have been put forward in this country favouring some sort of retaliatory tariff action on the part of the British Parliament in the event of the tariff being enacted. To such a course the board of directors is entirely opposed. No such action could be effectively taken by this country without the introduction of Customs duties which would confer in greater or less degree the privilege of protection upon British industries. It is the conviction of the board that any step of this nature would be fraught with the most momentous consequences, and that it should be resisted by the Chamber with the utmost earnestness and energy." Mr. H. E. Wollmer moved that this paragraph be struck out. Mr. Burges, who declared himself a protectionist, seconded the motion, which was in the form of an amendment to the resolution to adopt the report. Mr. Fogg opposed the amendment, and in the course of his speech claimed that the German imports were of benefit to our trade, a large proportion of them helping us in cheap manufacture, while our own production was not displaced by them, nor the employment of our people injured. The amendment received four votes and was rejected by a large majority. The report was then adopted. Mr. Marshall Stevens, one of the original promoters and the first manager of the Manchester Ship Canal, laid before the Chamber a series of tables dealing with the position of the port of Manchester in comparison with other ports.

Sheffield.—The annual meeting of this Chamber was held on 30th January last, at Sheffield, Mr. W. F. Beardshaw (the president) in the chair. After some remarks by Sir Howard Vincent on the proposed German tariff, and other matters, Mr. Batty Langley, M.P., said that, with reference to the suggested increase and revival of trade in South Africa, he was not so hopeful about it. South Africa, for three or four years, would be in a very quiet state so far as trade was concerned. There was a falling-off in the demand for labour in this country. There might be a boom in trade for a few months, but he believed there would be a reaction, and that there would be a very great disappointment after the war was closed. Mr. J. F. Hope, M.P., strongly supported the importance of commercial knowledge of foreign languages, and urged the Associated Chambers not to put forward long programmes, but to push strongly some one matter of the first importance, such as the adoption of the metric system. Mr. F. W. Beardshaw was re-elected president and Mr. Herbert Hughes was re-appointed secretary.

Walsall.—At the twentieth annual meeting of the Chamber held on the 24th ult., Mr. H. D. Clark presiding, the report of the Council stated that the membership of the Chamber had increased from 135 to 195. A large amount of the work undertaken had been of much interest and advantage to local industries and to the trade of the country generally. The saddlery, harness, and other leather industries had again during the past year benefited in a considerable degree by the demands of the War Office, but not to such an extent as in the previous year. The chairman, in moving the adoption of the report, expressed regret that the president (Mr. F. Rathbone) was unable through absence abroad to fulfil this duty, particularly as the success of the year's work was in a great measure the result of Mr. Rathbone's initiative. He believed they would all agree that the trade of the town, although not equal to the previous year's trade, was of a satisfactory nature. The War Office favoured the town with a large number of contracts, the effect of which had no doubt been to enhance the prosperity and wealth of the community. A reference to the Board of Trade's returns showed that the exports of saddlery and harness reached the largest total since the year 1890. The turnover for the twelve months was £585,225, as against £477,000 in the previous year. This, he believed, was the best trading record they had been able to point to, except in one instance, for twenty years, and it showed that not only had local manufacturers and merchants been busy upon War Office contracts, but that they had also been alive to giving attention to the other orders which had been received. This was particularly

gratifying, inasmuch as in every case the colonies had taken an increased amount of these commodities. Canada, Australia, British East Indies, and South Africa, all had augmented their demands, and the only falling off had been in regard to the Continent and South America, in each of which cases a satisfactory explanation for the decrease could be given. The trade of the country, as a whole, had also maintained a high standard. Twelve months ago they had to report that the United Kingdom did the largest volume of trade ever recorded, the total amounting to 877 millions. During last year there was a decrease of 6 millions, but compared with three years ago there had been an increase of over 100 millions in the general volume of trade; this was a most satisfactory state of things. The chairman afterwards reviewed the work of the Chamber during the past twelve months. Mr. T. A. Smith said the war had opened the eyes of the world to the fact that the horse was not likely to become such an extinct animal, with such disastrous results to Walsall trades, as some people thought would be the case when the motor-car was introduced. He thought the trade returns proved that the country had to look to the colonies for an expansion of trade rather than to foreign nations. Mr. A. W. Hutton said that as a result of the action of the Chamber progress was being made with the standardisation of tests of iron and steel. The resolution was carried unanimously.

GENERAL INTELLIGENCE OF THE PAST MONTH.

February, 1902.

UNITED KINGDOM.

FEB. 1st: The London Water Bill was issued. The Sanitary Inspectors' Association held their annual meeting. Small-pox increased in London. New transatlantic freight rates were announced.

2nd: Death of the Earl of Munster.

3rd: Alderman S. Roberts (C.) was elected M.P. for the Ecclestone Division of Sheffield. In the House of Commons a supplementary vote of £5,000,000 was passed for war charges, including cost of remounts. Lord Hamilton made a speech on the condition of India. The Queen and Princess Victoria left London for Sandringham. Death of Sir J. B. Mouclton.

4th: In the House of Commons a motion for the disestablishment of the Church of England in Wales was rejected. The Queen Victoria Memorial Fund amounted to £187,600. Sir W. Harcourt addressed a meeting of the National Poultry Organisation Society.

5th: The Chamber of Shipping held their annual meeting. Lord Salisbury was entertained at dinner by the Junior Constitutional Club. Princess Louise, Duchess of Argyll, distributed prizes at the Battersea Polytechnic. In the House of Commons, the Deceased Wife's Sister Bill passed the second reading.

6th: The Prince of Wales was formally admitted as a Fellow of the Royal Society. Mr. J. Wood (Land Purchase Candidate) was elected M.P. for East Down. Death of Col. W. A. J. Wallace, C.I.E.

7th: Sir C. P. Ilbert was appointed Clerk of the House of Commons in the room of Sir A. Milman, resigned. The Ven. Archdeacon Pryce was appointed Dean of Bangor. Death of Mr. T. Sidney Cooper, R.A., in his 99th year.

8th: A medallion of John Ruskin was unveiled in Westminster Abbey. Death of the Rev. G. Blunt, rector of St. Luke's, Chelsea.

9th: Death of the Rev. Sir George W. Cox. Death of Col. the Rt. Hon. W. Brownlow-Forde.

10th: The annual meeting of Governors of the Clergy Orphan Corporation was held. Small-pox increased in London. In the House of Lords it was announced that Wei-hai-wei was not to be fortified as a military and naval station.

11th: The King held the first levée of his reign at St. James's Palace. The London County Council adopted the report of the Water Committee on the London Water Bill. The National Education Association held their annual conference. Mr. J. Daly (N) M.P. for Monaghan, resigned his seat. Death of Sir Herbert Croft.

12th: Death of Lord Dufferin. The new entrance lock of the South-west India Dock was opened. A conference on Anglo-Russian trade was held at the London Chamber of Commerce Offices.

13th: Mr. Chamberlain was presented with an address from the Corporation of the City of London.

14th: Lord Rosebery addressed a great Liberal meeting at Liverpool. Death of Sir Archibald Milman. In the House of Commons, Mr. Jeffrey was elected Deputy Chairman to act as Speaker when required.

15th: The Army Estimates for 1902-3 were issued, amounting to £69,000,000. Death of General J. G. Touch.

16th: Death of Capt. W. T. Mainprize, R.N., C.B.

17th: In the House of Lords the Vaccination Act (1898) Amendment Bill was thrown out, and the Remounts question was discussed. Lieut.-Col. J. H. Eden was appointed an Inspector of Constabulary. Death of Sir Robert Micks. Death of Field Marshal Sir Neville Chamberlain.

18th: Death of the Rev. Dr. Newman Hall. A deputation waited on Mr. Chamberlain asking for transport for 500 Welsh settlers from Patagonia to Canada. In the House of Lords the Shops (Early Closing) Bill was negatived on the second reading. Death of Colonel E. C. Knox.

19th: The National Liberal Federation held its annual meeting at Leicester. A monument to the late Lord Leighton was unveiled in St. Paul's Cathedral. In the House of Commons the Urban Site Value Rating Bill was rejected. Death of Mr. P. W. Clayden.

20th: Death of Sir W. C. Leng. The Queen left Marlborough-house for Sandringham. Death of Earl Fitzwilliam. The National Labour Committee opened their annual conference in Birmingham.

21st: The King left London for Burton-on-Trent on a visit to Lord Burton. The Civil Service Estimates were issued.

22nd: The King visited Messrs. Bass & Co.'s brewery at Burton. The Consecration of Canon Gore as Bishop of Worcester took place in Lambeth Palace.

23rd: Death of Dr. S. R. Gardiner. Death of Lady Herschell.

24th: The King returned to London from Rangemore, Lord Burton's seat. Lord Tweedmouth addressed a Liberal meeting at Camberwell. It was resolved in Belfast to erect a memorial to the late Lord Dufferin. In the House of Lords the Cremation Bill was passed. Death of General Sir P. Penrose. Death of the Dowager Countess of Dundonald.

25th: The Bishop of Worcester was enthroned in Worcester Cathedral. Mr. Hebert Hart resigned the Chairmanship of the Liberal Imperialist League. The Shire Horse Show was opened at the Agricultural Hall. In the House of Commons the Navy Estimates were passed. Death of Lord John Hervey.

26th: A National Service League was established under the presidency of the Duke of Wellington. The metropolitan water companies issued a memorandum denouncing the Government Bill as violating the rights of property. Mr. M. D. Chalmers, C.S.I., was appointed to succeed Mr. C. P. Ilbert as First Parliamentary Counsel.

27th: The King visited the Shire Horse Show. The Duke of Devonshire presided at a meeting of the Liberal Unionist Council.

COLONIES.

Australia.—19th: Mr. Barton suggested that large horse-breeding stations should be established in Australia to supply the Army.

New South Wales.—10th: A patriotic demonstration took place at Sydney to support the Government policy with regard to the war in South Africa.—21st: It was proposed to establish works on the Parramatta river for the manufacture of steel rails from native ore.

Victoria.—24th: It was reported that Sir John Forrest would leave for England in May, and that he would become High Commissioner for the Commonwealth in London.

South Australia.—6th: The death of Sir John Colton, a former Premier, was announced.

Queensland.—4th: The Parliament was dissolved. In his election manifesto the Premier condemned the policy of the Commonwealth Government.

New Zealand.—1st: The 8th contingent left Auckland for South Africa.

British West Africa.—12th: More fighting with the Aros occurred. Major Heneker captured Ikarodaka, near Akweta, a stronghold of the Igas.—21st: The Aros were reported to be submitting and surrendering their rifles.

Canada.—6th: It was announced that Mr. David Mills, K.C., would resign the Ministry of Justice. It was reported that Ontario manufacturers were about to establish sample rooms in London, England.—8th: Mr. G. B. Hunter, of Newcastle-on-Tyne, stated that Canada would beat the world in the manufacture of steel ships.—11th: Mr. C. Fitzpatrick, K.C., was appointed Minister of Justice in succession to Mr. D. Mills, and Mr. H. Carroll became Solicitor-General.—13th: The Dominion Parliament was opened.—20th: The British Empire League of Canada held its annual meeting.—24th: Sir Charles Tupper advocated the principle of a mutual preferential trade policy as a means of consolidating the Empire.—25th: Senator Templeman, of British Columbia, became a Minister in the Dominion Cabinet without portfolio.

Cape Colony.—6th: The weekly mail train service to the north was resumed. Sir W. Hely Hutchinson returned to Cape Town.—8th: A meeting was held in Cape Town to protest against the slanders on British troops.—10th: Death of the Bishop of Pretoria.—18th: Commandant Judge Hugo was captured near Hangfontein.

Malta.—8th: A proclamation was issued formally withdrawing the announcement that English would become the official language of the Law Courts.—10th: The Governor announced that a change in the Constitution would have to be effected, if the Council persisted in refusing to vote the taxes necessary for the Administration.—16th: The elected members of the Council resigned as a protest against the Governor's notification.—19th: The official members of the Council passed the education vote and other necessary estimates.

Natal.—26th: The Parliament was opened.

Newfoundland.—11th: The winter herring fishery was reported to be one of the best on record.—20th: The Legislature was opened.—26th: The Bill for renewing the *modus vivendi* was read a second time.

Orange River Colony.—7th: De Wet broke through the blockhouse line near Liebenberg Vlei, and escaped with about 30 followers: 283 Boers were killed, wounded, or taken prisoners, and 700 horses were captured.

Transvaal.—2nd: Colonel Byng routed a Boer force under Commandant Wessels.—4th: Further large captures of Boers were reported.—5th: A number of mines on the Rand were permitted to resume working.—10th: Lord Kitchener reported further Boer casualties and captures. The strength of the Boer forces in the field was stated to be 12,000.—15th: Twenty-five additional Boer leaders were banished. 3,000 Boer refugees were removed from Pietersburg to Colenso.—17th: The first meeting of the new Town Council of Pretoria was held; it was announced that the seat of Government would not be changed.—20th: A Boer force of 164 men was captured on the Botha Berg near Middelburg.—21st: The Transvaal Customs returns for 1901 showed a total of £500,444, on imports to the value of £3,664,149. The Gold Commission concluded its sittings at Johannesburg.

INDIA.

4th: The number of persons on famine relief was 223,000.—9th: The Afridis raided a village near Jamrud.—11th: The number on famine relief was reported to be 280,000.—15th: The number of persons on famine relief increased to 307,000.—24th: The Mahsud Waziris paid their fine and delivered up 60 rifles.

FOREIGN COUNTRIES.

Afghanistan.—18th: It was reported that the widow of the late Ameer and her younger son, Nasrullah Khan, were likely to give trouble to the Ameer Habibullah.

Argentine Republic.—22nd: Sir T. Holdich arrived at Buenos Ayres.

Austria-Hungary.—15th: Labour riots occurred at Trieste.—17th: A number of anarchists were arrested in Trieste.—21st: Death of Dr. Emil Holub, the African explorer.

Belgium.—22nd: The Sugar Conference re-assembled in Brussels.

Bulgaria.—6th: M. Kantcheff, Minister of Public Instruction, was assassinated in his office.—23rd: Miss Stone, the American missionary, was released by the Bulgarian brigands at Strumetza in Macedonia.

China.—1st: The Dowager Empress gave audience to the ladies of the Legations.—2nd: Yung Lu was appointed Grand Secretary. Edicts were issued legalising marriages between Manchus and Chinese, and urging the abandonment of the custom of foot-binding among females.—6th: The Germans acquired exclusive mining rights over a large area in Shan-tung. The British and Japanese Ambassadors protested against the Manchurian agreement.—8th: The Government dismissed all European professors at the Imperial University.—10th: It was reported that a German mission in Kwantung had been destroyed.—14th: The Anglo-Japanese treaty of alliance was cordially welcomed by the Chinese.—22nd: The Russian Government declared that Manchuria would never be closed to American trade and commerce.—24th: The New Year's reception of the Diplomatic Corps by the Dowager Empress

took place.—25th: The United States proposed that the indemnity total should be kept within the amount of 450,000,000 taels.

Cuba.—1st: The condition of the island was reported to be alarming.—24th: It was announced that the Cuban Electoral College had selected Señor Palma and Señor Estevez as President and Vice-President respectively, of Cuba.

Denmark.—14th: Many protests were made against the sale of the Danish West Indies.

Egypt.—16th: Lord and Lady Cromer visited the Assiut barrage works, and Lady Cromer laid the coping stone of the works.

France.—1st: President Loubet signed a decree curtailing the powers of the head of the Naval General Staff.—8th: Prince Victor Napoleon issued a manifesto to the Imperialists condemning the Parliamentary system.—14th: The Chamber voted the abrogation of the Falloux law, guaranteeing liberty of instruction in France. M. Santos Dumont's balloon fell into the sea near Monte Carlo.—21st: The Senate voted 80,000fr. for the celebration of the Victor Hugo centenary.—26th: The Victor Hugo centenary was celebrated at the Panthéon.

Germany.—7th: The Navy Estimates were adopted by the Reichstag. Steps were taken to suppress faith-healing and so-called Christian science in Germany.—10th: The Agrarian League opened its annual congress in Berlin.—11th: Herr von Walzdorf, Finance Minister in Saxony, resigned.—14th: The Tariff Bill Committee carried a resolution that the new tariff must come into force not later than January 1, 1905.—15th: Prince Henry of Prussia left Bremerhaven for New York.—20th: The annual congress of the Navy League was held in Berlin.

Holland.—5th: Conferences were held at Utrecht between the Boer delegates, Dr. Leyds, and Mr. Kruger.—13th: The Boer delegates left the Hague for New York.

Italy.—20th: Parliament was opened.—21st: Signor Zanardelli's Cabinet resigned.—23rd: At the instance of the King the Ministry withdrew their resignations. Strikes of gas-work artificers and railway workers occurred in Turin.

Japan.—12th: An important treaty between Great Britain and Japan with regard to China and Korea was announced in the Diet.

Morocco.—23rd: The Sultan gave his approval to the proposed railway line from Duvyrier to Djenan-ed Dar.

Roumania.—23rd: A serious disturbance took place in Bukharest.

Russia.—1st: Count Tolstoi was reported to be seriously ill.—4th: It was announced that no foreigners would be allowed to travel by the Port Arthur-Petersburg route without special authority.—7th: The Archduke Franz Ferdinand of Austria arrived in St. Petersburg, and was met by the Tsar and the Grand Duke.—15th: A severe earthquake occurred in the Schemacha district in Transcaucasia.

Spain.—7th: The Chamber of Deputies passed a Bill proposing that the Customs duties on certain articles should be paid in gold.—17th: Serious labour riots occurred at Barcelona.—21st: Martial law was proclaimed in Zaragoza and Tarragona.

United States.—1st: Mr. Shaw became Secretary to the Treasury, in succession to Mr. Gage.—9th: A great fire occurred at Patterson, New Jersey.—17th: The Senate ratified the Treaty with Denmark for the cession of the Danish West Indies.—21st: The final ratifications of the Hay-Pauncefote treaty were exchanged in Washington.—23rd: Prince Henry of Prussia arrived at New York.—24th: Prince Henry visited Washington, and was received by the President at the White House.—25th: The President and Prince Henry travelled to Jersey City, where the Emperor's new yacht *Meteor* was launched. The Senate passed the Philippines Tariff Bill.

Uruguay.—14th: Dr. Juan Carlos Blanco was re-elected President of the Senate and Vice-President of the Republic.

Mexican Sugar.—The sugar industry of Mexico (states the *Board of Trade Journal*) is beginning to be largely developed. In all parts capitalists are forming companies for the cultivation of the sugar-cane. There is, it is said, a marked tendency among Mexican cultivators to abandon the cultivation of maize for the more remunerative one of the sugar-cane. It is estimated that the area of sugar-cane plantations has increased by about 22 per cent. during the past season.

Turkestan Silk Industry.—It is stated in the *Journal de la Chambre de Commerce de Constantinople* that the entire supply of silk required in Russia will probably in a few years be furnished by Turkestan. In recent years as much as 400,000 pounds (pound = 36 lb. avoirdupois) of raw cocoons has been produced, although the rearing of silkworms is still conducted on the most primitive principles. The chief silk-rearing centres are Khokand, Andischan, Samarcand, Tashkent, etc. Eggs of French origin are chiefly used, mixed with some raised in the country itself. The price of cocoons varies at present from 8 to 9 roubles per pound.

Steel Chain Making.—A demonstration of the advantages claimed for a new steel link belting and the method of its manufacture has recently been given. The ingenious machine, which at a single process converts a ribbon of steel into a connected link chain without any waste of the metal, is the invention of Mr. Sylvanus D. Locke, and is said to have been for some time successfully worked in the United States. It is now intended to erect plant in this country, and to exploit the belting on the English and European markets. It is said that the invention will bring about the introduction here for the first time of link-belting made of high-grade tempered steel instead of malleable iron. The difference between the new and the old is, indeed, primarily the substitution of steel for iron.

Russian Trade with Persia.—The Russian Minister of Finance has authorised the total remission of the excise duty on matches manufactured in Russia and imported into Persia through the Russian Customs post at Sarakhs, in South-west Turkestan. In the case of sugar exported from Russia into Persia through Sarakhs the excise duty will be collected in the ordinary way, but refunded to the Russian exporter on verification of the bills of consignment by the excise authorities at Astrakhan, Petrovsk, or Baku. The match trade with Persia, though a comparatively trifling item in Russian exports, is none the less instructive, furnishing as it does under these new conditions a striking example of the latest prohibitive methods of Russian competition in Persia. The total remission of excise on matches renders it possible to deliver Russian matches into Persia at the cost of less than one farthing per hundred, a figure 20 per cent. below their retail price in Odessa, while the average inhabitant of Northern Persia can buy 10 lb. of Russian sugar for less than a Russian can buy 6 lb. in the town of Kieff, in spite of the fact that the latter lives in the leading centre of Russian sugar production, while the former has his sugar delivered to him by rail, steamship, and caravan at a distance of over 1,200 miles from the Russian sugar manufactory.—*Times*.

FORTHCOMING EVENTS.

UNITED KINGDOM.

Bristol.—On the 5th inst. the PRINCE and PRINCESS OF WALES will visit Bristol and cut the first sod of the new dock at Avonmouth.

Dartmouth.—On the 7th inst. the KING and QUEEN will lay the foundation stone of the new Naval Cadet College.

Devonport.—On the 8th the QUEEN will launch the battleship *Queen* at Devonport.

London.—On the 4th inst. the annual meeting (three days) of the ASSOCIATION OF CHAMBERS OF COMMERCE will begin.—On the 7th inst. the London Committee of the WOLVERHAMPTON ART AND INDUSTRIAL EXHIBITION will meet at the Mansion House, the Lord Mayor presiding; in the evening Sir George Hayter Chubb will entertain the London Committee and the Executive at the Whitehall rooms.—On the 11th, at the Royal Colonial Institute, Lord Lamington will read "SOME NOTES ON QUEENSLAND."—On the 14th the KING and QUEEN will hold a Diplomatic and Official Court at Buckingham Palace.—On the 19th the PRINCE OF WALES will open the NATIONAL PHYSICAL LABORATORY at Bushey House.

An INTERNATIONAL EXHIBITION OF MOTOR-CARS, etc., will be held at the Royal Agricultural Hall from the 19th to the 26th April.

A COLONIAL EXHIBITION, consisting of the colonial exhibits which were at the Glasgow Exhibition, will be opened at the Royal Exchange on the 10th inst., by the Lord Mayor in state. Among the colonies represented in the exhibits will be Canada, including Ontario, Quebec, Nova Scotia, New Brunswick, Manitoba, Prince Edward Island, British Columbia, the North-West Territories, and the Yukon, and also Australia, South Africa, and British North Borneo. The exhibition will remain open for six weeks.

Manchester.—On the 12th inst. the PRINCE and PRINCESS OF WALES will visit Owens College, Manchester.

COLONIES.

Cape Colony.—A *Reuter* telegram, dated February 21, states that a BRITISH COLONIAL AND INDUSTRIAL EXHIBITION will be opened at Cape Town in November, 1903.

FOREIGN COUNTRIES.

France (Aix-en-Provence).—An INTERNATIONAL AND COLONIAL EXHIBITION will be held at Aix-en-Provence from the 27th April to the 28th July next, under the auspices of the municipality of that town. The exhibition will comprise commercial, industrial and agricultural products, and also include sections relating to teaching and the arts. An area of about 25,000 square metres will be utilized. Applications for permission to exhibit will be received up to the 17th March next at the offices of the Administration, Rue de l'Opéra 9, Aix-en-Provence.

French Indo-China.—The Acting British Consul for Siam and Mengtse, in a recent report to the Foreign Office (No. 2,741), draws the attention of all British manufacturers having dealings with the Far East to the exhibition that is to be held at Hanoi during 1902. Every facility will be offered by the promoters to intending exhibitors, and it is hoped to make the exhibition thoroughly representative of the Far East.

Japan (Osaka).—Intending exhibitors at the FIFTH DOMESTIC EXHIBITION, to be held at Osaka from the 1st of March until the 31st July, 1903, should send in their applications to the Vice-President of the Fifth Domestic Exhibition Bureau, Osaka, before the 30th June next.

NAVAL AND MILITARY INTELLIGENCE.

NAVAL.

Admiral Sir C. G. Fane has been placed on the retired list, to date from January 25.

Commander W. V. Anson has been placed on the retired list with the rank of Captain, to date February 6.

The Admiralty have ordered blocks to be laid in No. 4 dock at Sheerness Dockyard for building a new sloop of the *Odin* class of 1,096 tons displacement.

The *Diadem*, cruiser, Captain Henry Leah, of the Eastern Division of the Channel Squadron, was paid off at Chatham on the 18th ult.

The *Goldfinch*, gunboat, was commissioned at Sheerness Dockyard on the 4th ult. by Commander F. C. Larnmouth, for surveying service abroad.

The King's yacht has been ordered to be ready to leave Portsmouth for Plymouth for His Majesty's use there on March 3.

The new cruiser *Hogue*, at Devonport, will be ready for her gun trials early next month, and can be prepared for commission by the end of June.

The Devonport Dockyard officials have informed the Admiralty that the refit of the battleship *Hove* will occupy at least a year, owing to the serious defects of her machinery.

Rear-Admiral Lord Charles Beresford, lately second in command of the Mediterranean Squadron, arrived in London on the 20th ult.

Vice-Admiral Sir C. E. Domville has been promoted to be Admiral, Rear-Admiral A. D. Fanshawe to be Vice-Admiral, and Captain Sir Edward Chichester, C.B., to be Rear-Admiral; to date from January 25.

Major H. W. L. Holman, R.M.L.I., attached to the Naval Intelligence Department at the Admiralty, has been appointed A.D.C. to the new Governor of New South Wales, Vice-Admiral Sir Harry Rawson.

On the occasion of the visit of the King and Queen to Dartmouth on March 7, the cruiser *Australia* will act as guard-ship, and several destroyers will line the river from Kingswear to Dartmouth.

Extensive preparations are being made at Chatham Dockyard for the launching of the battleship *Prince of Wales*, the naming ceremony of which vessel is to be performed by Her Royal Highness the Princess of Wales, on the 25th inst.

The cruiser *Good Hope*, the gift of the Cape Government, which is also to figure prominently at the Coronation Review, is now to undergo trials which will be of an unusually interesting character, and more severe than those to which new cruisers are generally submitted.

The new battleship *Bulwark* will be commissioned at Devonport on March 18 for service on the Mediterranean. She will probably replace the *Ramillies* as flagship of the second-in-command. The *Bulwark* will have a complement of 780 officers and men.

The *Irresistible*, battleship, was commissioned on the 4th ult., at Chatham by Captain G. M. Henderson and 870 officers and men for service as port guardship at Gibraltar, in the place of the *Devastation*, battleship, Captain F. G. Kirby, which is to return to England to be paid off.

Rear-Admiral Sydney M. Eardley Wilmot has been appointed Superintendent of Ordnance Stores, in the Department

of the Director of Naval Ordnance, from the 25th ult., in succession to the Storekeeper-General of Naval Ordnance, Colonel Sir Thales Pease, K.C.B.

In order to maintain the efficiency of torpedo-boat destroyers the Admiralty have pointed out to local naval authorities the necessity of leaving a nucleus of the engine-room staff in each vessel when the crews are changed. Such nucleus should consist of an engineer officer, one engine-room artificer, and two chief or leading stokers.

The armoured cruiser which is to be built at Chatham is to be named *Devonshire*. She will have a length of 450 ft., a breadth of 67 ft., and a displacement of 10,200 tons. The new vessel will be the longest that has ever been built at Chatham. She is to be constructed on the slip which is at present occupied by the *Prince of Wales*, battleship.

The second-class cruiser *Doris*, late flagship at the Cape, whose ship's company took a prominent part in the early part of the South African campaign with the Naval Brigade, will shortly be commissioned at Devonport for a further term of service on the same station. The *Doris* will relieve the cruiser *Gibraltar*.

The *Thistle*, gunboat, was commissioned by Lieut. and Commander E. S. Houseman at Devonport, on the 18th ult., to relieve the *Buzzard*, sloop, Commander L. F. G. Tippinge, on the North America and West Indies Station. The *Thistle* arrived at Devonport in 1899, but this is her first commission. She was built for river service.

Admiral Sir John Fisher, Commander-in-Chief of the Mediterranean Squadron, has been appointed Second Naval Lord at the Admiralty in the room of Admiral Douglas, who is to be appointed to the North America Station. Admiral Sir Compton Domville will succeed Sir J. Fisher in the chief command in the Mediterranean.

Experiments in wireless telegraphy have taken place between the Admiralty station at Dover at a point known as Spion Kop, near Shakespeare Cliff, and a cruiser steaming down the Channel. By the use of a special mechanism, which is stated to be a new invention and was tried for the first time, messages were successfully transmitted to a distance of about 40 miles further than had previously been obtained. The object of the authorities is to have wireless communication from Dover with Portsmouth on the west and Sheerness on the east.

Experiments have been conducted with regard to coaling ships at sea, while under way, between the battleship *Trafalgar* and the specially fitted collier *Muriel*. In the trials which have recently been concluded, the *Trafalgar*, while towing the *Muriel* at the rate of ten knots, managed to ship an average of 30 tons of coal per hour. While steaming at a slower speed, he amount of coal transported from the *Muriel* to the *Trafalgar* was 40 tons per hour. This performance is eminently satisfactory, considering that the system is almost in its initial stage.

The largest floating-dock in the world was launched on the 8th ult., at Wallsend-on-Tyne by Messrs. Swan and Hunter for the Admiralty, to supersede the old floating-dock at Bermuda placed in 1869, which is now obsolete. The new dock will accommodate for repairs the largest battleships and cruisers up to 17,500 tons. The launch was very successful. The rocky nature of the island of Bermuda made a floating-dock more suitable than a graving-dock of the ordinary kind. The dock will be towed to Chatham, thence to Bermuda. It is 545 ft. long and 100 ft. wide. It has been built specially strong in view of its passage across the Atlantic.

The second of the flotilla of submarine boats building by Messrs. Vickers, Sons, and Maxim, Limited, at Barrow, was launched on the 21st ult. The new boat is about 60 feet long, the dimensions being similar to those of the experimental boat now undergoing her trials. It has been found necessary, however, that certain alterations should be made in its construction, rendered advisable by defects which have been discovered during the testing of No. 1 boat. It is expected that three of the remainder of the flotilla will be ready for launching within a very short time, and the sixth, which is of a new type, may be completed in time to take part in the Coronation Naval Review.

The *London*, battleship, which left Portsmouth on the 3rd ult., for her 30 hours' trial at four-fifths power, returned at the end of a 26 hours' run and reported that the trial was satisfactory, but that it had to be curtailed because thick weather set in. As the results of these trials are calculated on the mean of the best consecutive 24 hours rather than upon the complete run of 30 hours, sufficiently good averages were obtained to allow the trial to be accepted as successful. The ship drew 26 ft. 3 ins. forward and 27 ft. 3 ins. aft, and had 262 lb. of steam in her boilers. The vacuum, starboard and port, was 26 ins., and the revolutions were 101.4 starboard and 100.7 port, produced by a mean i.h.p. of 11,718. There was no air pressure, and the speed by patent log was 16.4 knots on a coal consumption of 1.8 lb. per unit of power per hour. The *London* was brought into Portsmouth Harbour on the 13th ult., in order that she may be completed for sea. She has successfully undergone her machinery, torpedo, and gun trials, and is to be ready for commission by the end of April. The *London* will eventually relieve the *Majestic* as senior flagship of the Channel Squadron. She is expected to fly the Prince of Wales's flag as Admiral of England at the Coronation Review in June next.

Italy.—On the island of San Paolo, near Taranto, an armoured tower has been constructed by the Italian Government which has a weight of 5,000 tons, and has cost £480,000. It is armed with two hydro-pneumatic guns having a length of 42.65 ft. and a range of rather more than 11 miles.

Russia.—The work at the Russian Admiralty yards at Sevastopol and Nikolaieff is being pushed on with undiminished vigour. The latest addition to the battleship strength of the Black Sea fleet, the *Potenkin Tauritchsky*, is having her armour plates fixed in place. The work on two new cruisers and two sea-going torpedo-boats at Sevastopol and Nikolaieff is also well advanced. The *Novoe Vremya* states that the Russian Admiralty has ordered that during the present year the four new deep sea torpedo-boat-destroyers *Pavlin*, *Phazan*, *Lebed*, and *Pelikan* shall be transferred from the Baltic to the Black Sea fleet. An extraordinary vote of £1,650,000 will be made shortly for the purpose of building new warships for the Russian Navy during the present year. The Marine Technical Committee is already engaged in deciding upon the type of the projected vessels, not one of which is to be built abroad. The transport vessel *Ocean*, which was built recently at Kiel for the Russian Navy, is to be set apart specially for training assistant-engineers for the Navy.

MILITARY.

Major W. A. C. Denny, Army Service Corps, has been appointed D.A.A.G. at Hong Kong.

Captain Duncan, D.S.O., 1st Royal Scots, has been appointed Brigade Major of the Infantry Brigade at Malta.

Captain R. V. H. Alpin, 6th Battalion Lancashire Fusiliers, has been appointed Aide-de-Camp to Sir Cornelius Moloney, K.C.M.G., Governor of Trinidad.

Lieut.-Colonel T. D. Foster, Army Service Corps, lately serving in South Africa, has been appointed Deputy-Assistant Adjutant-General for Supply Inspection from the 1st prox., succeeding Major C. W. King.

Colonel W. S. Clarke, formerly commanding the 2nd Worcestershire Regiment, has been appointed to succeed Colonel De Berniere in command of the 29th Regimental District.

Brevet Lieut.-Colonel Lempriere has been appointed second in command of the 2nd Middlesex Regiment, *vice* Major Barnardiston, appointed Military Attaché in Holland and Belgium.

Colonel Scott, R.A., who has of late been employed at the India Office, has been appointed Director-General of Ordnance in India, in succession to Major-General R. Wace, C.B., appointed Ordnance Consulting Officer in London.

The War Office has notified that the South African medal is to be granted only to the militia units who volunteered for service abroad during the South African war, and whose services were accepted.

Brigadier-General Sir Hector MacDonald, D.S.O., now in command of a second-class district at Belgaum, Madras, has been appointed to succeed Major-General F. T. Hobson in command of the forces in Ceylon.

Official notification of the change in the composition of cordite has been made to contractors who supply the Government with ammunition. The charges with the improved cordite for the various service weapons will be as follows:—4.7-in. quick-firing gun, 5 lb. 7 oz.; 12-pr. quick-firing gun, 1 lb. 10 oz.; 6-pr., 7½ oz.; 3-pr., 6½ oz.; and the 303 service rifles, 30 grains.

The present type of ambulance waggon in use in the army does not appear to be altogether satisfactory, and the War Office are desirous of obtaining a new model. They are therefore offering two prizes—one of £500 and the other of £250—for the two best models sent in. Any British subject may compete, and the entry list will be closed on March 15. The waggons, however, need not arrive at the Woolwich Arsenal before the middle of July. There are certain qualifications which the waggons will be expected to possess. They must, of course, be light, strong, and capable of running smoothly over rough roads. In the matter of accommodation they must have room for four patients lying down, or twelve sitting, one hospital orderly, and a driver.

Navy Estimates for 1902-3.—The amount of the navy estimates for the year 1902-3 is £31,255,000; besides the construction of new ships, there is a plan of modernisation of the armament of many of the older armoured and protected vessels at present with the fleet. The aggregate expenditure is an increase over last year (including supplementary vote) of £179,500. New construction takes up £9,058,000, and embraces: 2 battleships, 2 armoured cruisers, 2 third-class cruisers, 4 "scouts," 9 destroyers, 4 torpedo boats, 4 submarines—total, 27 of all types. Twenty-five ships are to be "improved." Eight battleships of the *Royal Sovereign* class are to have secondary batteries on upper deck (comprising six 6-in. quickfiring each) placed in armoured casemates. Battleships *Barfleur* and *Centurion* are each to have their ten 4.7 guns, firing a 50 lb. shell, replaced by 6-in. quickfiring, firing a 100 lb. shell. Cruisers *Powerful* and *Terrible* are each to have four more 6-in. quickfiring in casemates added, increasing the total number of these weapons to sixteen. Thirteen cruisers of the *Arrogant* and *Talbot* classes are each to have six 6-in. quickfiring in place of 4.7 in. weapons. Between April 1st, 1901, and March 31, 1902, inclusive, the following ships will have been completed and passed into the Fleet Reserve:—Battleships: *Formidable*, *Implacable*, *Irresistible*, *Bulwark*, *Vengeance*. Armoured cruisers: *Aboukir*, *Cressy*, *Hogue*, *Sulej*. First-class cruiser (protected): *Spartiate*. Third-class cruiser (protected): *Pandora*. Royal yacht: *Victoria and Albert*. Sloops: *Mutine*, *Rinaldo*, *Espiegle*, *Fantome*. River steamers: *Teal* and *Moorhen*. 22 destroyers, 4 torpedo-boats, 5 submarines. A new class altogether is to be created in the "Scouts," which are to be destroyers of "greater sea-keeping power." Seamen throughout the fleet are to have a new dietary.

METRICAL WEIGHTS AND MEASURES.

TABLES FOR CONVERTING METRICAL WEIGHTS AND MEASURES.

HECTOGRAMME.	ACRE.	KILO-MÈTRE.	ENG. MILE.	SQUARE KILO-MÈTRE.	ENG. MILE.
0.405	1	2.471	1.609	1	0.386
0.809	2	4.942	3.219	2	0.772
1.214	3	7.413	4.828	3	1.158
1.619	4	9.885	6.438	4	1.544
2.023	5	12.356	8.047	5	1.930
2.428	6	14.827	9.656	6	2.316
2.833	7	17.298	11.265	7	2.702
3.237	8	19.769	12.879	8	3.088
3.642	9	22.240	14.484	9	3.474
4.047	10	24.711	16.093	10	3.860
8.093	20	49.422	32.186	20	7.720
12.140	30	74.134	48.279	30	11.580
16.187	40	98.846	64.373	40	15.440
20.234	50	123.557	80.466	50	19.300
24.286	60	148.268	96.559	60	23.160
28.327	70	172.980	112.652	70	27.020
32.373	80	197.692	128.745	80	30.880
36.420	90	222.403	144.839	90	34.740
40.467	100	247.114	160.932	100	38.601

MÈTRE.	YARD.	KILO-GRAMME.	LB. AVOIR.	LITRE.	GAL. LONG.
0.914	1	1.004	0.454	1	0.22
1.829	2	2.187	0.907	2	0.44
2.743	3	3.281	1.361	3	0.66
3.658	4	4.374	1.814	4	0.88
4.572	5	5.468	2.268	5	1.10
5.486	6	6.562	2.722	6	1.32
6.401	7	7.655	3.175	7	1.54
7.315	8	8.749	3.629	8	1.76
8.229	9	9.843	4.082	9	1.98
9.144	10	10.936	4.536	10	2.20
18.288	20	21.873	9.072	20	4.40
27.432	30	32.809	13.608	30	6.60
36.576	40	43.745	18.144	40	8.80
45.719	50	54.682	22.679	50	11.00
54.863	60	65.618	27.215	60	13.20
64.007	70	76.554	31.752	70	15.40
73.151	80	87.491	36.288	80	17.60
82.295	90	98.427	40.823	90	19.80
91.438	100	109.363	45.359	100	22.01

For the use of these tables the following explanation is necessary:—The figures in heavier type represent either of the columns beside it, as the case may be; viz., with hectares and acres in the first set of columns, 1 acre=0.405 hectare, and vice versa, 1 hectare=2.471 acres, and so on.

STATISTICAL NOTES.

Ceylon.—TEA EXPORTS, 1901.—The following table, taken from Gow, Wilson and Stanton's report, shows the distribution of tea exports from Ceylon, from 1st January to end of December, during the four years, 1898-1901:—

COUNTRIES.	1901.	1900.	1899.	1898.
United Kingdom	105,734,570	113,760,193	103,948,124	96,133,833
Austria	50,958	24,633	8,231	14,873
Belgium	17,781	22,954	14,424	13,590
France	317,866	326,800	98,952	100,001
Germany	586,104	402,717	346,959	352,252
Holland	19,041	2,000	30,211	26,351
Italy	13,924	8,332	13,521	6,730
Russia	9,653,896	8,917,185	3,949,740	2,714,003
Spain	250	17,730	18,700	44,650
Sweden	65,104	71,300	78,088	42,471
Turkey	40,978	47,009	18,733	73,974
India	1,139,113	1,144,013	567,616	1,091,559
Australia	20,652,804	17,606,912	15,606,833	15,126,891
America	4,502,131	3,980,680	3,080,002	2,180,188
Africa	395,730	280,699	288,239	372,242
China	2,694,819	1,262,463	1,384,490	1,185,445
Singapore	147,560	119,178	83,813	59,867
Mauritius	55,376	17,323	100,248	33,299
Malta	312,633	419,518	257,232	196,852
Total lb.	146,310,638	148,431,639	129,894,156	119,769,071

Natal.—TRADE IN 1901.—The following table showing the values of the imports into and the exports from Natal, and the Customs revenue of the Colony for the year ended 31st December last, as compared with the preceding year, is based on official figures published monthly in the *Natal Gazette*:—

	1900.	1901.
Imports	£5,911,518	£9,822,686
Exports—		
Colonial	571,346	1,205,973
Non-Colonial	563,976	3,062,844
Total exports	1,135,322	4,268,817
Customs revenue	655,042	812,375

NOTE.—The figures for 1901 are approximate only.

Included in the non-colonial exports is raw gold to the value of £1,150 in 1900, and £764,993 in 1901.

The imports as shown in the above table include the value of goods imported overland (i.e. overland from the Transvaal, Orange River Colony, and other places), as well as those imported by sea.

Sweden.—IRON INDUSTRY.—The following table shows the quantities of the various kinds of iron, etc., exported from Sweden during the year 1901, as compared with the preceding year:—

EXPORTS OF IRON, ETC.

	1900.	1901.
	Tons.	Tons.
Pig-iron	84,500	84,600
Scrap-iron	—	8,100
Ingots	9,000	5,900
Bloom-iron and rough bars	21,900	18,200
Bar-iron	164,200	142,100
Bar ends	5,100	3,200
Iron wire in coils	5,500	4,400
Sheet-iron	2,500	1,500
Tubes and parts of tubes	—	6,000
Drawn wire	1,000	900
Nails	2,700	3,000
Total	296,400	277,900

The following table shows the production of iron in each of the years 1900 and 1901:—

PRODUCTION OF IRON.

	1900.	1901.
	Tons.	Tons.
Pig-iron	520,600	513,300
Bloom-iron	189,500	164,700
Bessemer ingots	91,500	77,300
Siemens Martin ingots	200,400	181,100

British Fuel Exports.—In spite of the influence of the coal tax, the total quantity of coals and coke sent out of the Tyne last year was above that of the preceding year. The exact shipments were from the River Tyne in 1901, 14,933,635 tons of coal and coke; in 1900, the quantity was 14,520,929 tons. There was thus an increase of 412,706, which is a substantial increase. The total includes fuel exported, fuel sent coastwise, and fuel shipped for the use of the steamers themselves. It is noteworthy that the coals sent out of the river increased by more than 518,000 tons, but there was a decrease in the coke exports of over 105,000 tons, so that the net increase was that above stated. The shipment of coals and coke is now one of the greatest of the industries of the North, and it is satisfactory from that point of view to find that there was, in a year of trial to the trade, the very large increase on the figures of the preceding year, though the shipment has been one that has been at a lower value on the average.—*Newcastle Chronicle*.

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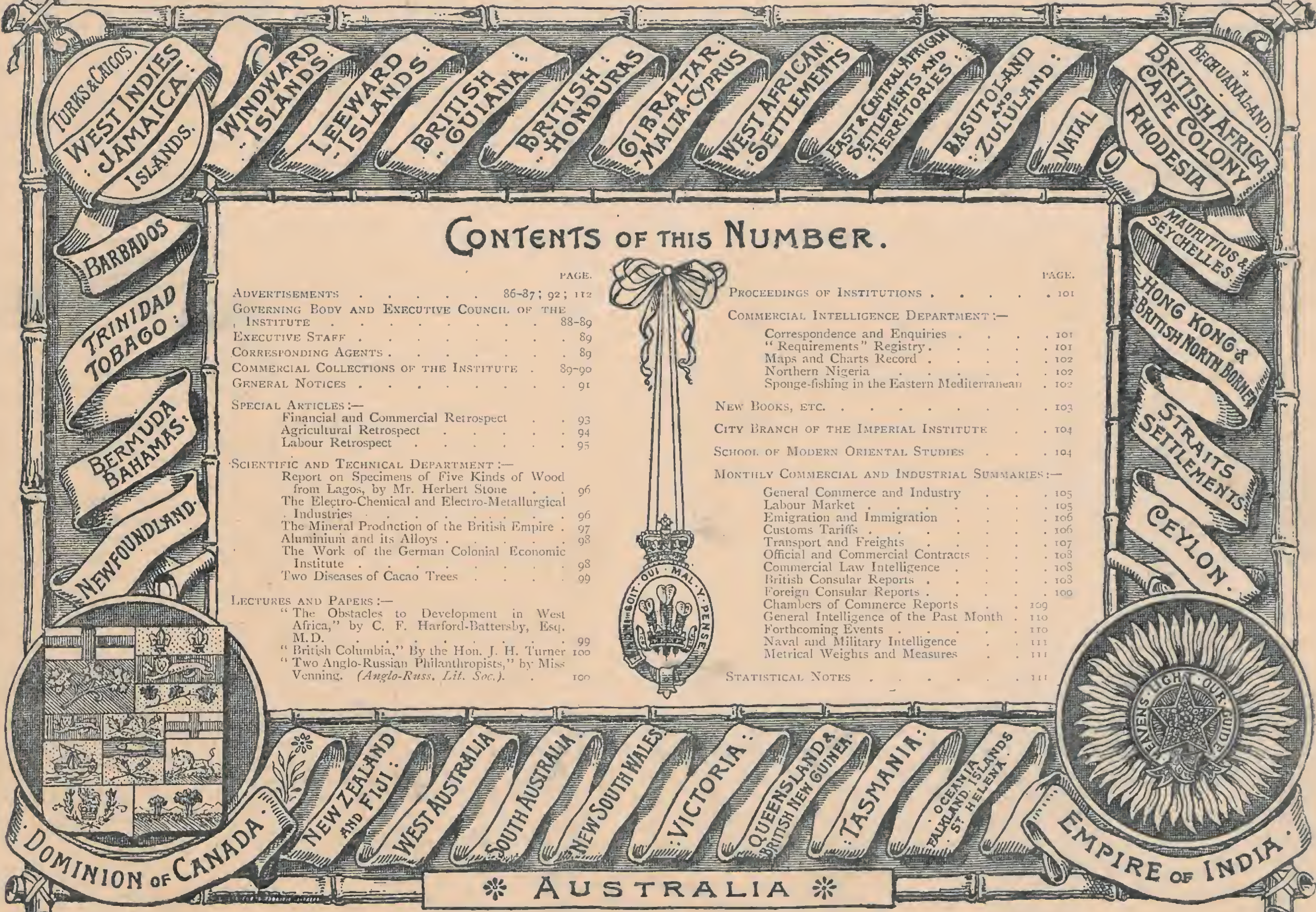


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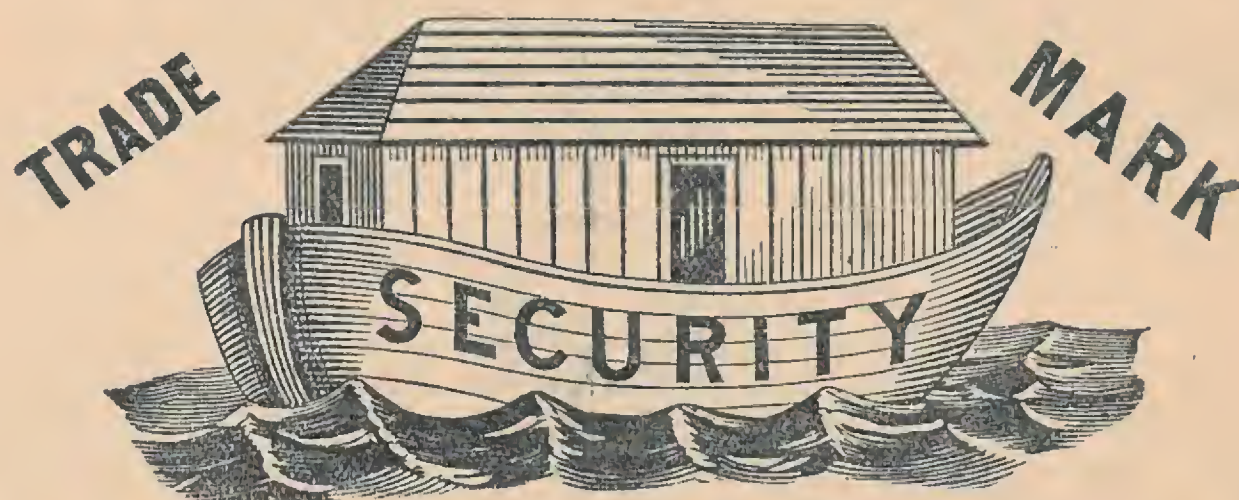
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(*West Central Lower Gallery.*)

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[ONE VACANCY.]

Corresponding Agent in Colony.—(At present through the Agent-General's Office.

Curator of Collection.—Mr. LEWIS ATKINSON.

Products Exhibited.—Agricultural produce, building stones, coal dried fruits, furs minerals (including asbestos, gold-bearing quartz, copper ores, diamondiferous gravel etc.), stuffed ostriches, ostrich eggs and feathers, Angora hair, tobacco, wines, wools, etc

NATAL. (*West Central Lower Gallery*)

Representative Governor.—SIR WALTER PEACE, K.C.M.G.

Corresponding Agent in Colony.—Mr. C. B. LLOYD, Commissioner of Agriculture and Mines, Natal.

Curator of Collection.—(In charge of Institute Staff.)

Products Exhibited.—Agricultural produce, Angora hair, tanning barks, building stones, coffee, cutlery, indigenous timbers, minerals, coal, silk cocoons, spirits, sugar, tea, tobaccos, wine, wools, native ornaments, etc., etc.

RHODESIA AND BECHUANALAND.

(*West Central Lower Gallery.*)

Representative Governors.—Those of CAPE COLONY.

Curator of Collection.—Mr. LEWIS ATKINSON.

Products Exhibited.—Specimens of native workmanship kindly lent by the late

[Queen Victoria.

NYASSALAND, BRITISH CENTRAL AFRICA.

(*West Central Lower Gallery.*)

Products Exhibited.—(By the British Central Africa Chamber of Agriculture and Commerce).—Coffee, ivory, *Landolphia* rubber, chillies, *Strophanthus* seeds, beeswax, photographs, etc.

BRITISH AMERICA.

(*West and Upper West Central Galleries.*)

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Products Exhibited.—Canadian furs from Hudson's Bay Co., stuffed birds, wood pulp, slates, vehicles, minerals (asbestos, apatite, mica, plumbago, etc.), agricultural produce, fruits, tobacco, maple sugar, timber, Indian ornamental work, cotton, linen, and leather, and iron manufactures.

THE COMMERCIAL COLLECTIONS OF THE INSTITUTE—continued.

BRITISH AMERICA—continued.

DOMINION OF CANADA—continued.

PROVINCE OF ONTARIO.

Representative Governors.—SIR HENRY TYLER and JOHN PATON, Esq.

Corresponding Agent in Province.—Mr. ARCHIBALD BLUE, Director of Mines, Toronto.

Products Exhibited.—Agricultural produce, preserved fruits, indigenous timbers, gold, silver, iron, lead, and nickel ores, petroleum, marble, granite and decorative stones, coal, native wines, honey, canned meats, and woodwork.

PROVINCE OF BRITISH COLUMBIA.

Representative Governor.—The Hon. J. H. TURNER (Agent-General).

Corresponding Agent in Province.—(At present through Agent-General's Office.)

Products Exhibited.—Agricultural produce, coal, Douglas fir and other timbers, minerals, preserved fruit, tinned salmon, fish oils, woodwork, birds, and animals.

PROVINCE OF NEW BRUNSWICK.

Representative Governor.—C. A. DUFF MILLER, Esq., Agent-General.

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Products Exhibited.—Timbers, minerals, building stones.

PROVINCE OF MANITOBA.

Representative Governor.—The Rt. Hon. the LORD STRATHCONA and MOUNT-ROYAL, G.C.M.G.

Corresponding Agent in Province.—The PROVINCIAL SECRETARY.

Products Exhibited.—Agricultural produce (including barley, beans, corn, oats, peas, rye, wheat, flour, &c.); birds, comprising ducks, grouse, partridges, snipe, etc.; heads of wapiti, caribou, moose and other large game; specimens of native workmanship, photographs, head-dresses, clubs, arrows, beadwork, etc., etc.

PROVINCE OF NOVA SCOTIA.

Representative Governor.—JOHN HOWARD, Esq., Agent-General.

Corresponding Agent in Province.—(At present through Agent-General's Office.)

Products Exhibited.—Minerals, samples of iron ore and products manufactured from the ore, wood-wool.

NORTH-WEST TERRITORIES.

Representative Governor.—THOMAS SKINNER, Esq.

Corresponding Agent in Province.—(At present through the Representative Governor.)

Products Exhibited.—Grain.

NEWFOUNDLAND.

(Upper West Central Gallery.)

Representative Governor.—[VACANT.]

Corresponding Agent.—

Products Exhibited.—Minerals (including ores of iron, copper, manganese, chromium, lead, antimony and zinc, molybdenite, mispickel, mica, asbestos, steatite, granite, marble, slate, coal, and petroleum) and timber.

BERMUDA.

(Middle of Central Lower Gallery.)

Representative Governor.—Gen. SIR ROBERT BIDDULPH, G.C.B., G.C.M.G.

Corresponding Agent.—THE COLONIAL SECRETARY.

Products Exhibited.—Arrowroot, woods, silk, shell-work, and sandstone.

WEST INDIES.

(West Central Lower Gallery.)

BRITISH GUIANA, TRINIDAD, AND TOBAGO.

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Corresponding Agent.—Trinidad and Tobago: THE COLONIAL SECRETARY.

Curator of Collection.—(In charge of Institute Staff.)

Products Exhibited.—Arrowroot, cereals and pulses, medicinal barks, cocoa, coral, coffee, indigenous timbers, lace, fibres, rum, spices, starches, sugars, timber, leather, skins, drugs, fish glue, basket-work, condiments, etc.

JAMAICA AND BAHAMAS, WINDWARD ISLANDS, AND BARBADOS.

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Hon. Curator.—[VACANT.]

Products Exhibited.—Arrowroot, barks, cocoa, coral, coffee, indigenous timbers, lace-bark, fibres, rum, spices, starches, sugars, sarsaparilla, wax, oils, condiments, turtle, etc.

BRITISH HONDURAS.

Representative Governor.—J. McMURRICH CURRIE, Esq.

Corresponding Agent.—[VACANT.] *Hon. Curator of Collection.*—J. M. CURRIE, Esq.

Products Exhibited.—Banana and cassava meal, cocoanut oil, coffee, horns (deer), indiarubber, Indian corn, medicinal barks, pickles, preserved fruits, rice, rope and cordage of native manufacture, rum, seeds edible and ornamental, spices, sponges, sugar, mahogany and other timbers, tobacco, etc.

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Corresponding Agents.—Grenada: THE COLONIAL SECRETARY.

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Products Exhibited.—Arrowroot, barks, cocoa, coral, coffee, indigenous timbers, fibres, rum, spices, starches, sugars, etc., etc.

FALKLAND ISLANDS. (Middle of Central Lower Gallery.)

Representative Governor.—Gen. SIR ROBERT BIDDULPH, G.C.B., G.C.M.G.

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Products Exhibited.—Wool, birds' skins and eggs.

BRITISH AUSTRALASIA.

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(East Central Upper and Lower Galleries.)

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Products Exhibited.—Minerals (including gold, silver, coal, &c.), wool, indigenous timbers, wines, cereals, seeds, gums, resins, oils, fibres, rope, leather, tallow, etc., etc.

VICTORIA.

(East Central Upper and Lower Galleries.)

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Products Exhibited.—Animals, birds, coal, cereals, chemical manufactures, cigars, essential oils, gums, grain, hops, indigenous timbers, leather, leatherware, minerals (including auriferous quartz, coal, kaolin, etc.), models of gold nuggets, seeds, sugar, tobacco, wines, wool, etc., etc.

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Products Exhibited.—Building stones, eucalyptus oils, fibres, minerals, pearl shells, indigenous woods, cereals, models of fruits, sugar, wine, tinned meats, hides, skins, leather, etc., etc.

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(East Central Lower Gallery.)

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Products Exhibited.—Wools, gums and resins, olive oil, fibrous barks, silk, skins, indigenous woods, minerals, model gold ingots, etc., etc.

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(East Central Lower Gallery.)

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(East Central Lower Gallery.)

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Products Exhibited.—Agricultural produce, building stones, coal, Kauri gum, hemp and flax, tinned meats, wools, tobacco, Kauri and other woods, with illustrations of their application to structural and ornamental purposes; photographs, etc., etc.

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(Middle of Central Lower Gallery.)

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Curator of Collection.—(In charge of Institute Staff.)

Products Exhibited.—Barks, fibres, copra, tea, cocoa, coffee, timbers, etc.

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(East Gallery.)

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(East Gallery.)

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Products Exhibited.—Barks, canes, drugs, fibres, preserved fruits (including Singapore pine-apples), mats, silk fabrics, oils and oil-seeds, dyes and tans, gums, gutta-percha, tin ores and other minerals, teas, coffee, spices, timbers, etc., etc.

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(West Central Lower Gallery.)

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Products Exhibited.—Fibres, hemp, oils, rum, seeds, sugars, tortoise-shell, vanilla beans, with specimens of native workmanship, etc., etc.

HONG KONG.

(Middle of Central Lower Gallery.)

Representative Governor.—SIR WILLIAM ROBINSON, G.C.M.G.

Corresponding Agent in Colony.—The HARBOUR MASTER.

Curator of Collection.—(In charge of Institute Staff.)

Products Exhibited.—China, carved and inlaid ivory and wood-work, silver and lacquer ware, silk and cotton fabrics, drugs, paints, dyes, food stuffs, etc., etc.

BRITISH NORTH BORNEO.

(West Central Lower Gallery.)

Corresponding Agent.—(At present through the British North Borneo Co.)

Curator of Collections.—(In charge of Institute Staff.)

Products Exhibited.—Timbers, rattans, coal, rice, sago, sugarcane and raw sugar, coffee, cocoa pods, pepper, tobacco, beeswax, camphor, gutta-percha, kapok fibre, dammars, cutch and gambier, hemp, honey, etc.

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(West Central Gallery.)

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Corresponding Agent.—(At present through the Representative Governor.)

Curator of Collections.—(In charge of Institute Staff.)

Products Exhibited.—From Malta—Carved stone-work, lace, macaroni, honey, various fabrics, models, pictures, etc., etc. Gibraltar and Cyprus—None at present.

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 This JOURNAL is distributed (by post) throughout the United Kingdom, India, and the Colonies of the British Empire, and to the following Foreign Countries:—Argentine Republic, Austria-Hungary, Belgium, Bolivia, Chili, China, Colombia, Costa Rica, Denmark, Egypt, France, Germany, Greece, Hawaiian Islands, Holland, Italy, Japan, Mexico, Montenegro, Morocco, Norway, Persia, Peru, Portugal, Russia, Siam, Spain, Sweden, Switzerland, Tripoli, Turkey, United States of America, Uruguay, and Venezuela. The JOURNAL is also placed in the Reading Rooms of CHAMBERS OF COMMERCE, CLUBS, and HOTELS, both at home and abroad.

SPECIAL NOTICE.

EXHIBITION OF GIFTS AND ADDRESSES PRESENTED TO THE PRINCE AND PRINCESS OF WALES, DURING THEIR COLONIAL TOUR IN 1901.

His Royal Highness the PRESIDENT of the IMPERIAL INSTITUTE has decided that an EXHIBITION shall be held in the North Gallery of the Institute of the GIFTS and ADDRESSES presented to their Royal Highnesses the PRINCE AND PRINCESS OF WALES on the occasion of their visiting the Colonies in 1901. The Exhibition will be open to the Public (Admission 1s.) on the 15th May, from 11 a.m. to 7 p.m., and until further notice. The PRINCE OF WALES has also decided that the proceeds of the Exhibition shall be added to the "CORONATION GIFT" to KING EDWARD'S HOSPITAL FUND.

FELLOWS' DEPARTMENT.

The Reading, Writing, and News Rooms, are open for the use of Fellows every week-day from 10 a.m. till 11.30 p.m., and on Sundays from 3 p.m. to 10.30 p.m. The Library (on the First Floor), is open from 10 a.m. to dusk on Week-days; and from 3 p.m. to dusk on Sundays. The Map Room (First Floor) is open from 10 a.m. to 5 p.m. on Week-days.

The Poste Restante is open every week-day for receipt and delivery of letters and parcels. Letters addressed to initials only are not received, except in reply to notices in the JOURNAL, under "Requirements" Registry. The General Post Office Pillar Box is cleared daily twelve times, between 10.10 a.m. and midnight. Light refreshments only are, for the present, provided in the Fellows' Rooms and at the bar of the Ceylon Kiosk.

EMIGRATION INFORMATION OFFICE.

The Office of the British Women's Emigration Association (see page 106), in the West Corridor, First Floor, is open daily from 10 a.m. to 4 p.m., and advice and information respecting emigration and openings in the Colonies may be obtained there free of charge. Enquiries of all kinds relating to the Colonies from intending Emigrants are dealt with in the Commercial Intelligence Department, and special information respecting Canada and the Cape Colony may also be obtained from the Curators for these Colonies, on application personally at their offices, or by letter.

SCHOOL OF MODERN ORIENTAL STUDIES.

An "Ouseley" Scholarship of £50 per annum, tenable for two years, will be awarded, should sufficient merit be shown, for proficiency in PERSIAN. No person will be admitted to competition for a Scholarship in a language which is his own mother tongue, nor for a Scholarship in a language allied to his mother tongue. The examination will take place early in July next. Full particulars may be obtained of the Secretary to the School, Imperial Institute. (For further information see page 104.)

IMPERIAL INSTITUTE JOURNAL.

An ornamental Cloth Cover, for binding the numbers of the JOURNAL for the year 1901 into one volume, may be obtained at the TICKET OFFICE of the INSTITUTE, or from Messrs. WATERLOW AND SONS LIMITED, Blomfield-house, London-wall, E.C., price 2s. 6d. An index and title-page to the volume were inserted in the January issue of the JOURNAL. Bound volumes of the JOURNAL for the seven years, 1895-1901, may be had at 10s. each.

SCIENTIFIC AND TECHNICAL DEPARTMENT.

The Scientific and Technical Department of the Institute has been established to acquire information by special enquiries and by experimental research, technical trials and commercial valuation regarding new or little known natural or manufactured products of the various Colonies and Dependencies of the British Empire and of foreign countries, and also regarding known products procurable from new sources, and local products of manufacture which it is desired to export. This work is carried out with a view to the creation of new openings in trade, or the promotion of industrial developments.

In the extensive and well-equipped series of Research Laboratories occupying the West Corridor of the Second Floor, a staff of skilled Chemists, under the direction of Professor Wyndham R. Dunstan, M.A., F.R.S., carry out the investigation of the chemical constitution and properties of new dye-stuffs, tanning materials, seeds and food-stuffs, oils, gums and resins, fibres, timbers, medicinal plants and products; animal products, minerals and ores, soils, cements, and various other products, with a view to their commercial utilization. Whenever necessary these materials are submitted to special scientific experts, by whom they are made the subjects of particular investigation or practical tests. Reports are also obtained from technical or trade-experts in regard to the probable commercial or industrial value of any such products, whilst full information is collected from official or other trustworthy sources regarding the probable extent and cost of available supplies. All materials requiring scientific or technical examination, or commercial valuation, should be submitted to the Institute for examination either by, or through, the Foreign Office, the Colonial Office, the India Office, or the Board of Trade, or through the Colonial or Indian Government Authorities. Requests for the examination of such materials may also be submitted by Public Commercial Bodies and Institutions of the respective Colonies and Dependencies, or by the Representatives of H.M. Government in foreign countries.

COMMERCIAL INTELLIGENCE DEPARTMENT.

The Office of this Department, in the West Corridor, First Floor, is open daily from 10 a.m. to 5 p.m. (on Saturdays till 1 p.m.), for the purpose of answering enquiries and supplying information relating to the Commerce (Export and Import) and Industries of India and the Colonies. Applications may be made personally or by letter. Special information may be obtained from the Curators in charge of the Indian and of certain Colonial Collections. Arrangements have been made for the translation for mercantile firms of Trade Circulars, Price-Lists, and Catalogues into any Foreign Language, including the conversion of weights, measures and coinages, etc., at cost price, and application for such may be addressed to this Department.

COMMERCIAL COLLECTIONS.

The Galleries containing the Colonial and Indian Collections, and the Public Commercial and Industrial News Room, are open for free inspection by the public daily, except Sundays, and any days specially notified, from 11 a.m. until 5 p.m. Every information concerning the products, their supply, etc., can be obtained on application to the Curators of the Indian and Ceylon, Canadian, and South African Sections, to the general Curator, and to the Commercial Intelligence Department.

CITY BRANCH OF THE IMPERIAL INSTITUTE.

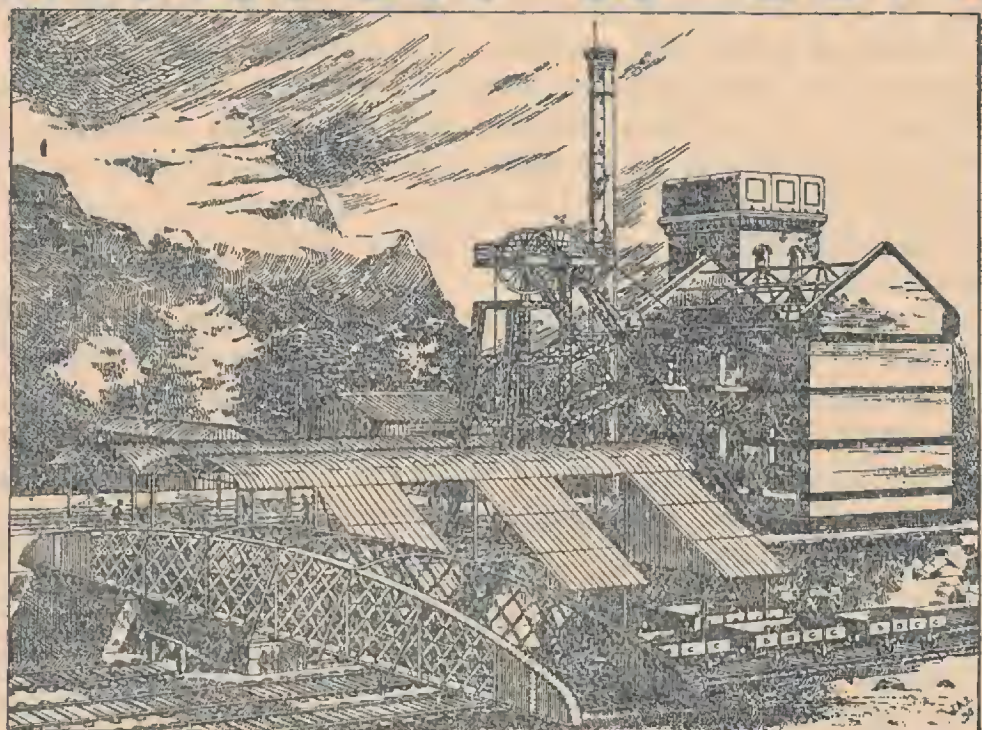
The Reading Room and Enquiry Offices, open to annual subscribers of £1, and free to Fellows of the IMPERIAL INSTITUTE, will be removed, towards the end of the month, from 112, Cannon-street, to larger premises at 49, Eastcheap, where a commodious apartment will also be opened early in May for the display, to merchants, manufacturers, etc., of raw and manufactured products received, from time to time, from the Colonies and from India, and for which it is desired to find openings in the British markets. Curators and other members of the Imperial Institute staff will attend at the office at stated times and by special appointment, to deal with enquiries and to assist in establishing or facilitating business relations with mercantile houses, etc., in the Colonies and in India. The City Branch will be in constant communication, by telephone and messengers, with the Imperial Institute, South Kensington. (For further information see page 104.)

THE NORTHBROOK SOCIETY.

The Northbrook Society is affiliated to the Imperial Institute, and has a special room allotted for the exclusive use of its members in the Institute buildings. Its primary objects are to watch over and promote the interests of natives of India, and to provide a system of guardianship or supervision over such as are sent to Europe for education. The Society is controlled by a committee consisting of an equal number of Governors of the Imperial Institute and members of the Society, presided over by the Earl of Northbrook. It possesses an excellent library. Indian members, who pay no subscription to the Society, have the especial advantage of becoming Fellows of the Institute at half the usual subscription payable by the ordinary Fellows. Applications for membership of the Society should be addressed to the Secretary of the Northbrook Society, Imperial Institute, London, S.W.

"REQUIREMENTS" REGISTRY.

With the object of affording Fellows of the Imperial Institute, and the General Public resident in the United Kingdom, an opportunity of making known special "wants" or "needs" in the British Colonies, India, and Foreign Countries, space will be regularly devoted to approved notices in a column reserved for this purpose. Advertisers may have their replies addressed to them direct, c/o the Imperial Institute, London, S.W., under a distinctive number and initials. The cost of postage will be charged for the transmission of replies delivered at the Institute. Residents in the Colonies and India, and Foreign Countries, can register in like manner. (For further particulars see page 101.)

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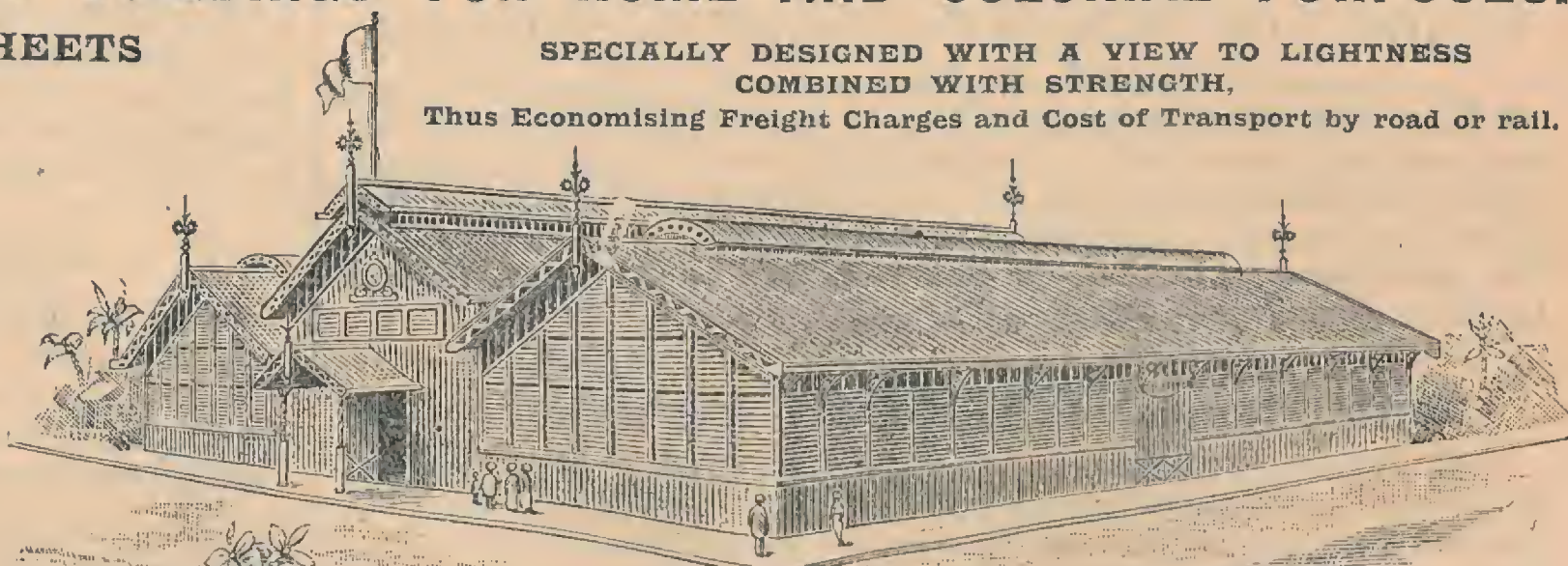
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FINANCIAL AND COMMERCIAL RETROSPECT.

UNITED KINGDOM.—The trade returns for February show increases in both the imports and exports compared with the same month of last year, though the re-exports of foreign and colonial merchandise, worth £5,804,101, were less by £162,187. As regards the imports, which were valued at £41,691,591, and thus showed an increase of £1,977,152 or 4·9 per cent., there were improvements in almost every class of goods except duty-free articles of food and drink, living animals, and chemicals. In the first-named class the decrease amounted to £604,579. Among cereals, barley alone was greater in quantity and value, which increased by 29 and 26·4 per cent. respectively. In wheat, owing to smaller shipments from Argentina, there was a decline of 9·3 per cent. in quantity and 11·6 per cent. in value. In wheat-flour, of which there was a diminished supply from the United States, the fall was 12·9 per cent. in quantity and 16·5 per cent. in value. Oats fell by 53·7 and 43·8 per cent. in the two respects, and Indian corn by 29·5 and 17·6 per cent., the United States sending over 3¼ million cwt. less. There was a large increase in rice—140·6 per cent. in amount and 102·5 per cent. in value. In sugar a big rise was recorded; the refined exactly doubled in weight and its value increased 27·3 per cent. to £1,304,060, while the quantity of the raw article rose by 58·7 per cent. and its value by 21·2 per cent. to £907,479. In raw materials for textile manufactures, larger shipments of cotton from the United States, Egypt and Brazil increased the weight by 33·9 per cent. to 492,473 cwt., the value, £4,722,358, being higher by 17·4 per cent. or £702,168. Cotton manufactures also increased in value by 22·2 per cent. to £489,204. Flax was less in quantity and value, hemp improved 13·9 per cent. in the former and 36·6 in the latter, jute was higher both in amount (36·3 per cent.) and value (24·3 per cent.), while in raw silk the rise in quantity was 173·3 per cent. and in value 147·1 per cent. Wool again showed considerable improvement—an increase of 15·9 per cent. in quantity and of 4·8 in value to £2,267,118; larger shipments arrived from South America, British South Africa, New Zealand, France and India, though Australia sent less. In the exports, which were worth £21,312,276, there was an increase of £274,821 or 1·3 per cent. The quantity of coal was greater by 9·1 per cent. (253,900 tons), but its value was less by 10·3 per cent. (£221,530). Iron and steel were better by 3·7 per cent. in quantity, but the value was fractionally less. In machinery there was a loss in value to the extent of 5·9 per cent.; new ships exhibited an improvement of £193,800. In yarns and textiles, cotton yarn increased 5·8 per cent. in quantity but fell off 9·1 in value, China taking more while Japan took much less. Cotton piece-goods were better by 13,262,300 yards (3·1 per cent.), but the value decreased by £29,070 or 0·6 per cent.; here, also, China was mainly responsible for the increased exports, the Indian demand being smaller. The quantity of wool increased by 122·4 per cent., but its value only about half that percentage. Woollen and worsted yarns were less in value by 9·1 per cent., though their quantity was higher by 2·5 per cent.; woollen and worsted tissues, however, were better in all respects, the former by 4·3 in quantity and 10 per cent. in value, and the latter by 17·2 and 18·4 per cent. In chemicals, all articles were higher, except sulphate of copper. Soda compounds increased 22·9 and 29·7 per cent. in quantity and value, while chemical manures were better by 27·6 and 34·3 per cent.

COLONIES.—In the course of his Budget speech the Treasurer of the Dominion of Canada estimated the revenue for the current year ending in June at \$56,800,000 or \$4,000,000 more than in last year. The total surplus he put at \$5,800,000. He spoke cheerfully of the future, and hoped for a broadening of the treaty with France, and a satisfactory treaty arrangement with Germany. In regard to the latter, he urged that it was a mistake to suppose that Canada had discriminated against her. Canada had indeed withdrawn some commercial privileges from Germany, but they were such as should only be granted to the family circle of the British Empire, and no foreign country should expect to enjoy them. Canada was quite ready to allow Germany as favourable treatment in her markets as was allowed to any other foreign country. This argument, it may be mentioned, is not accepted as convincing in Germany.

The increase in the Customs revenue of the Australian Federation for the current financial year is £578,000. New South Wales showed an increase of £351,859, Victoria of £14,000, South Australia of £18,000, Tasmania of £8,000, and Western Australia of £307,000. Queensland reported a decrease of £122,000. The reductions in the Tariff made by Parliament amount to £300,000, and the increases to £85,000. Queensland showing a decrease of £208,000 on the State Tariff of 1900, and Tasmania one of £110,000, the Government intend to adhere to the revenue duties proposed in the Tariff Bill—6s. per quintal on rice, 2d. a lb. on imported starch (besides an excise duty of 1d. per lb.), 3d. a lb. on tea, and 3d. a gallon on kerosine.

The gold yield of New South Wales in February was 10,952 oz. (scarcely more than half the amount in the same month last year), of Queensland 60,800 oz., of Western Australia 158,108 oz., and of New Zealand 41,632 oz.

According to the Natal Budget statement, the revenue of the colony for the past year was £683,000 above the estimate, and there was a surplus of £489,809 over the expenditure. The revenue for the current year is put at £3,400,000, and the surplus at £316,000. Customs are expected to show a large increase, but a diminution of £60,000 is expected in the railway receipts. The Budget statement of the Orange River Colony states that for the six months ending 31st December last, the total receipts were £131,000, and the expenditure £99,000. The surplus thus amounts to £32,000, although nothing has been received on account of railway profits, which in normal times vary from £400,000 to £500,000 a year. Among the items of the revenue are: Customs, £61,000; licences, £14,500; post-office, £12,000; dividends, £8,400; transfer duplicates, £1,000; agriculture, £14,600; and quit rents, £1,095. On the expenditure side, education cost £12,000; municipal police, £8,500; district administration, £7,800; prisons, £7,500; post office, £11,000; public works, £8,000; and agriculture, £3,000. In addition £400,000 has been spent on the refugee camps, including £30,000 on native camps, but the whole of this sum has been recovered from the army funds. The financial position of the colony is regarded as highly satisfactory, considering that many sources of revenue are at present locked up. For example, nothing is included in the Budget on account of claim-licences, which normally produce at least £8,000 a year, and quit-rents, which figure for only £1,095, in ordinary times yield something like £15,000 annually. The gold output of the Witwatersrand mines that have restarted crushing amounted in February to 81,405 oz. of fine gold; in January the amount was 70,340 oz. The Rhodesian mines yielded 13,204 oz. in February; this is in advance of the output (12,237 oz.) for February of last year, but considerably less than that for January last (15,954 oz.).

The Egyptian accounts for 1901 were closed at the beginning of last month. The revenue was £E12,160,000 against £E11,663,000 in the previous year, an increase of nearly £E500,000. The actual expenses incurred in 1901 were £E9,924,000, or £E24,000 more than in 1900. The balance of £E2,236,000 was distributed as follows: £E64,000 was paid into the Sinking Fund, £E265,000 into the Economies Fund, and £E1,143,000 to the General Reserve Fund controlled by the Caisse of the Public Debt. The residue, £E764,000, represents the surplus at the disposal of the Egyptian Government. Testimony is borne to the flourishing condition of Egypt's finances by the balances standing to the credit of the various reserve funds at the end of 1901; these were as follows: Economies Fund, £E4,491,000; General Reserve Fund, £E3,795,000; Special Reserve Fund, £E1,287,000. The total of these sums is £E9,573,000.

The following table shows the variations which have occurred in certain Colonial Government securities during the last three months:—

	28th Jan.	25th Feb.	26th Mar.
Canada 3 per cent. . . .	101¼-101¾	101-101½	101-101½
Cape 3 per cent. . . .	94-94½	96-96½	96½-97
Natal 3 per cent. . . .	93½-94½	93-94	93½-94½
New S. Wales 3 per cent. . .	95¼-96¼	96½-97	95-95½
New Zealand 3 per cent. . .	94½-95	95-95½	93½-94
Queensland, 3 per cent. . .	93¾-94¼	94¾-95¼	95-95½
South Australia 3 per cent. .	93-93½	93½-94	94-94½
Tasmania 3½ per cent. . .	103½-104½	103½-104½	103½-104½
Victoria 3 per cent. . . .	96½-97	96½-97	96½-97
West Australia 3 per cent. (May-Nov.)	92½-93½	93¼-93¾	93½-94½

INDIA.—The financial statement for the present year was made in the Legislative Council on March 19th. The accounts for 1900-1901 show an improvement in revenue over the revised estimate of £106,000. The gross railway receipts improved by £197,000, and the net railway profits were £325,000. An increase in revenue of £4,355,000 is shown by the revised estimate for 1901-1902, as compared with the estimate in last year's budget. The chief increases are under the following heads:—Land revenue, £299,000; opium, £311,000; stamps, £147,000; excise, £119,000; Customs, £644,000; mint, £515,000; railways, £1,750,000; military receipts, £115,000; other sources, £454,000. Under other heads there is a decrease of £2,000. The expenditure is less by £1,027,000. The heads under which reductions occur are direct demands on the revenue, £320,000; interest, £144,000; civil departments, £295,000; other public works, £417,000; army services, £1,006,000; and various minor groups, £131,000, the total being £2,213,000. On the other hand, there are increased expenses in connection with the mint, £431,000; with railways, £768,000; minor heads, £87,000; and provincial surpluses and deficits, £1,400,000. The net result is an increase of the surplus by £3,982,000 to £4,673,000. The Budget estimate for 1902-1903, as compared with the revised estimate for 1901-1902, shows the following decreases in revenue, amounting in all to £2,445,000:—Land revenue (explained by remission of arrears), £680,000; opium £625,000, owing to lower prices estimated for; Customs £232,000, a continuance of the abnormal importation not being expected; mint £482,000, no allowance made for coinage of new rupees; railways £229,000, the inflation of traffic not being expected to continue; and various minor decreases, £198,000. The increases amount to £269,000, made up of irrigation £121,000, and minor items £148,000. On the expenditure side there are the following increases:—Direct demands on revenue, £546,000; civil departments, £965,000, including law courts £118,000; police, £147,000; education, £358,000; medical, £157,000; political, £222,000; irrigation works,

£253,000, including special grant of £167,000 for minor irrigation works; railways £294,000, due to interest charges; other public works, £848,000; army services, £1,535,000, no allowance being made for continued absence of troops; minor increases, £231,000. These increases make up a total of £4,673,000. Against this sum must be set decreases of £388,000 on the mint and £40,000 interest, making the net increase in expenditure £4,244,000. There is, therefore, a surplus of £838,000, after taking into account a net decrease of £2,585,000 in provincial surpluses and deficits, as compared with the revised estimate. The estimated capital outlay of 9,809,000 is made up as follows:—Railways and irrigation works, £8,152,000; deposits and advances, £979,000; net advances by Imperial Government and provincial governments, £341,000; and payment of Council Bills, £16,837,000, against drawings by the Secretary of State, £16,500,000. On the capital receipt side appear the items:—Imperial surplus, £838,000; amount to be raised through railway companies for State railways £2,200,000, and to be raised and deposited by railway companies, £1,613,000; permanent debt increase £1,041,000, including £1,000,000 to be raised in India; addition to unfunded debt, £543,000; remittances, net, £562,000; reduction of combined cash balances in India and England, £3,011,000; closing balances on March 31st, 1903, in India £10,832,000, in England £4,051,000. The railway programme includes the expenditure of £3,672,000 on open lines, £2,432,000 on lines under construction, £832,000 on lines recently begun, and £398,000 on those to be begun during the next cold weather—total, £7,334,000. The special grants include £1,321,000 for the assistance of the agricultural classes and remission of arrears of land assessments, £738,000 being the immediate charge during the next financial year; £167,000 for minor irrigation works; £267,000 for education; £213,000 for public works; and £120,000 for sanitary and administrative provincial requirements. In all the above figures the pound sterling has been taken as equivalent to 15 rupees.

The variations which have occurred in the securities of certain Indian railway companies are shown in the following table:—

	29th Jan.	26th Feb.	27th Mar.
Bengal and North Western . . .	130-134	131-135	130-134
Bengal-Nagpur Gua. 4 per cent. .	105-109	103-107	103-107
Bombay, Baroda & Cent. India .	155-165	157-163	156-161
Indian Midland 4 per cent. . .	104-108	103-107	103-107
Madras Grntd. 5 per cent. . .	136-140	133-137	132-136
South Indian 4½ per cent. Deb. .	137-142	138-143	138-143
Southern Mahratta 3½ per cent. .	106-109	106-109	106-109

FOREIGN COUNTRIES.—The following is our usual table of exchanges:—

	29th Jan.	25th Feb.	27th Mar.
Paris, cheques	25f. 12½c.	25f. 15½c.	25f. 17½c.
Berlin, sight	20m. 44¼pf.	20m. 48pf.	20m. 46pf.
Vienna, sight	23kr. 93½	24kr. 00½	24kr. 01½
Amsterdam, sight	12fl. 13½	12fl. 14½	12fl. 15
Madrid, sight	33ps. 80	34ps.	34ps. 87
Lisbon, sight	40d.	40½d.	41½d.
St. Petersburg, 3 months . .	93r. 90	94r. 05	94r. 05
Bombay, T.T.	1s. 4½d.	1s. 4½d.	1s. 4d.
Calcutta, T.T.	1s. 4½d.	1s. 4½d.	1s. 4d.
Hong Kong, T.T.	1s. 10d.	1s. 9½d.	1s. 9½d.
Shanghai, T.T.	2s. 6½d.	2s. 5½d.	2s. 5d.

AGRICULTURAL RETROSPECT.

UNITED KINGDOM.—Substantial progress was made during March with spring work. Tillage operations were continued with but little interruption, and the seeding of spring corn was completed in good time. The growing crops made steady progress. A continued improvement was seen in the young wheat and also in winter barley, whilst pastures and grass lands had, by Easter, fully regained their verdure. The lambing season has so far proved a most favourable one, though there has been some difficulty as to keep. It is to be hoped, therefore, that there will be no recurrence of severe weather to check the spring forage crops.

A trustworthy guide to the scale-insects of this country has long been needed, and there has now appeared the first volume of Mr. Robert Newstead's *Monograph of the Coccidæ of the British Isles*, issued by the Ray Society. This volume deals only with the sub-family *Diaspine*; the remainder will occupy the second volume, together with a bibliography. The volume is valuable not only from the scientific standpoint, owing to its detailed discussion of individual species, but equally from the economic point of view on account of the eminently practicable methods which are described for the suppression of scale infestation. The chief natural enemies of scales are other insects and also birds. The story of the victory obtained by the fruit-growers of California over the fluted scale by the acclimatization from Australia of an insect—a ladybird—that preys upon it, has often been told. Of natural enemies of scale in this country the author directs special attention to the titmice, notably the blue tit, and he bases his evidence upon repeated examinations of the contents of the stomachs of these birds. The chief artificial methods of coping with scale-attack are fumigation with hydrocyanic acid gas and spraying with various insecticidal solutions, the modes of preparing which are described. Special methods are indicated for the suppression of root-feeding species.

COLONIES.—Under the presidency of Dr. Morris, the Imperial Commissioner of Agriculture, the fourth West Indian Agricultural Conference was held at BARBADOS on January 4 and 6 last. In his presidential address, Dr. Morris passed in review the various industries of the islands, from sugar to bee-keeping and onion-growing. With regard to the question of central factories, he expressed the hope that in some of the smaller sugar islands it had approached a stage when the details may be submitted to the consideration of the planting community. In Barbados the opinion is not unanimous that central factories would materially improve the condition of all classes of the community. It is only proposed to introduce factories gradually, but so long as nothing is done it is difficult to look forward with any degree of comfort to the future of the sugar industry of the island. Papers on various subjects were read and discussed, sugar, naturally, taking the foremost place. There were communications on sugar-cane experiments in Barbados, Antigua, St. Kitts, Trinidad, and British Guiana. In Guiana an important feature has been the trials of canes on an estate scale, in addition to the necessary small plots. Reliable facts have just been obtained with regard to many industrial questions which cannot be satisfactorily answered from small plot experiments alone. In a paper on the Jamaica sugar industry, it was stated that under specially favourable conditions, canes could be produced at six shillings per ton. At the Conference Dinner, Sir Frederic Hodgson, the Governor of Barbados, speaking of the sugar industry of that island, stated "while bounties affect us very considerably, yet apart from bounties a great deal could be done by ourselves in placing our industry in a better state. If we are to hold our own in the struggle for existence, it is absolutely necessary that we should have factories which are equipped with the latest machinery and all modern appliances." Mr. Sydney Olivier pointed out some important differences between Barbados and Jamaica. The former seems to be cultivated on a complete system, but "in Jamaica we have a large peasant population still widely maintaining an almost African system of agriculture. The African system is not to make two blades of grass grow where one grew before, but to cut down and destroy by burning large areas of forest growth to grow a few yams or tanniers, or a little ginger. We have to grapple with this primeval habit. We have to transform a system of wasteful agriculture into a modern system which must be productive of better results." It is fully realised by the officials of the Imperial Agricultural Department, that a strenuous attempt must be made to raise the general standard of intelligence amongst all classes: and it is in contemplation shortly to commence the publication of a fortnightly paper, the *Agricultural News*, containing hints and advice in regard to all points of interest in the islands.

Agriculturists in QUEENSLAND have entered upon the present year with hopeful prospects. According to the *Queensland Agricultural Journal*, the official organ of the State Department of Agriculture, the year 1902 has opened with great promise. The wheat harvest has been a record for Queensland. With reduced railway rates and fair prices for wheat and barley, with genial rains and absence of pests, the outlook for the year is full of hope. The yield of sugar has been most satisfactory, and the young cane gives evidence of vigorous growth, foreshadowing a large return by the end of the year. Fruit culture is extending in all parts of the State. Coffee- and rice-growing are making rapid strides in the North and South respectively, and in a very few years Queensland will be quite able to supply its own requirements of these two staples. Regret is expressed that cotton-growing should not again have been added to the industries of the State, as there seems to be no reason why this should not pay as well as wheat, maize, and other crops mainly cultivated by the farmers. If locally-grown cotton could be obtained in sufficient quantities to keep a mill going, an incentive would be provided to re-establish the manufacture of cotton goods in Ipswich. The dairy industry is expanding year by year, and is no longer conducted in the slipshod fashion that formerly prevailed. Factories and creameries have sprung up on all sides. Cold storage is provided on at least two of the coast steamers, and Queensland butter more than holds its own in the British markets, as is evidenced by a comparison of the product of Denmark and that of the Australian States. The opportunity afforded to intending settlers by the throwing open of the rich lands repurchased from the squatters has been so freely availed of that these lands, devoted not long since to the raising of sheep and cattle, now constitute the homes of hundreds of thriving farmers. There is, of course, the other side of the picture, sufficiently indicated in the following words:—"We would that we could congratulate the Western pastoralists on a final break-up of the disastrous drought which has wrought such dire ruin in many parts of Queensland. Unhappily, the wished-for consummation has not yet come to pass; and even when luxuriant grass and herbs once more cover the plains of the Warrego and elsewhere in the West, a long time must elapse before the flocks and herds are made up to their original numbers."

INDIA.—From the final general report on the cotton crop of India, issued at Calcutta by the Statistical Department, it appears that, although the crop has proved deficient in Bombay, Madras, and the Nizam's Territory, the production is so satisfactory in most other Provinces that the total is expected to be but little below an average, and is estimated at fully two million bales. The area planted with wheat in Bengal this year is estimated at only 1,404,700 acres, a total considerably below the normal area. It is explained that the falling off is due to the want of rain at sowing time. The Director of Land Records and Agriculture reports that

he is unable to estimate a higher out-turn than 75 per cent. of a normal crop, and even this will not be obtained unless there is rain to swell the grain.

FOREIGN COUNTRIES.—The complete returns of the foreign trade of the ARGENTINE REPUBLIC for 1901 are now available, and from them the following figures relating to the exports of the principal articles of agricultural production are taken. The corresponding totals for the two preceding years are added for comparison. The majority of the totals for 1901 will be found to exceed the corresponding ones for 1900, whereas the reverse is the case when the comparison is between 1900 and 1899.

AGRICULTURAL EXPORTS FROM ARGENTINA.

	1899. Head.	1900. Head.	1901. Head.
Live cattle . . .	312,150	150,550	119,189
Live sheep . . .	543,458	198,102	25,746
	Tons.	Tons.	Tons.
Frozen mutton . .	56,827	56,412	63,013
Frozen beef . . .	9,079	24,590	44,904
Jerked beef . . .	19,164	16,449	24,296
Wool	237,111	100,913	228,358
	Lb.	Lb.	Lb.
Butter	2,594,891	2,322,663	3,322,391
Cheese	18,161	1,883	2,968
	Tons.	Tons.	Tons.
Wheat	1,713,429	1,929,676	904,289
Maize	1,116,276	713,248	1,112,290
Linseed	217,713	223,257	338,828
Hay	105,598	102,836	95,120

A great shrinkage is seen in the exports of cattle and sheep. The closing of our ports against Argentine cattle and sheep during the whole of last year, and part of 1900, as a safeguard against foot-and-mouth disease has ruinously affected the trade in cattle, and brought the export of sheep from the River Plate almost to the verge of extinction, inasmuch as for every 20 sheep shipped alive in 1899 only one was so shipped in 1901. The enforced restriction in the shipment of live animals has, it will be seen from the figures, given an impetus to the frozen meat industry of the Argentine, the expansion of the frozen beef trade being greater than that of the frozen mutton trade. The export trade in butter is making steady progress. The shipment of 3,322,391 lb. in 1901, or 43 per cent. more than in 1900, is the largest yet recorded, and seems to indicate serious efforts on the part of the dairy farmers of the Plate Valley to compete with Australasia in supplying us with butter. The erratic nature of Argentina's supplies of wheat to the world's markets is illustrated in the circumstance that the exports of wheat in 1901, returned at 904,289 tons, were less than half of those in the preceding year. On the other hand, maize nearly recovered the level attained in 1899, and the exports of linseed, 338,828 tons in 1901, were 50 per cent. larger than in the previous year. The exports of hay (lucerne or *alfalfa*) have been slowly declining for several years.

An Insular Bureau of Agriculture has been established in the PHILIPPINE ISLANDS by the United States Government in order to remedy the deplorable condition of agriculture there, and Professor F. Lamson-Scribner, an accomplished botanist, who for nearly eight years has been agrostologist of the American Department of Agriculture, is appointed chief with headquarters at Manila. The current annual report of the American Secretary of War states, with reference to the Philippines, that "the methods of cultivation are primitive and ineffective; the ordinary vegetables, notwithstanding the fertility of the land, are small and poor, and the stock is evidently run out and should be renewed. Many grains which are unknown to the people can undoubtedly be raised. They live chiefly on rice, and raise less than they consume." The main object of the new bureau is "to promote the development of the agricultural resources of the archipelago," and it will take charge of and conduct the model farms and experiment stations which were established in a number of provinces under the Spanish *régime*. In view of the agricultural importance of the islands, and the great opportunities for development along many different lines, the field for research and economic work is considered to be exceedingly attractive, and it is anticipated that in course of time the bureau will develop into one of the strongest and most useful branches of the Insular Government.

The Railways of New South Wales.—The New South Wales Railway Commissioners recently submitted their report to the Minister for Railways for the quarter ended December 31. This quarter of the year is the summer season at the antipodes, and the principal portion of the wool is moving within that quarter from the inland districts to the seaboard, while grain is also carried to a considerable extent. The revenue for the three months was £1,071,789 and the expenditure £599,014, the former giving an increase of £19,390 and the latter of £65,207, so that the net revenue fell to the extent of £45,817. Various causes are put down as accounting for the reduction, principally the increased cost of material, higher wages to the staff, greater proportion of relaying and renewal work carried out, while the goods business suffered by reason of the reduction of rates which was made prior to the quarter, and which did not lead to a corresponding increase in business, and also by reason of the fact that there was a great proportion of low-freighted goods carried. The railway business is also said to have been affected by the fiscal question. New South Wales has to share the new tariff which came into operation on October 5, and no doubt in its incidence it has had a prejudicial effect upon the returns. In regard to the trams, the electric system continues to give the utmost satisfaction, and it is being extended.

A Motor Fishing Boat.—The first completely equipped motor fishing boat has just made her trial trip most satisfactorily at Lowestoft. There have previously been boats fitted with motors for propulsion merely, but this is the first fishing craft which will rely upon petrol to generate the force required for all purposes—hauling her nets, hoisting sails, working the capstan, and driving her pumps. The motor is of 24-h.p., and is fitted in a case 4 ft. by 2½ ft. It is only 3 ft. high, and the top cover serves for a table. The motor is of the three-cylinder, two-cycle type, and self-starting and reversing.

LABOUR RETROSPECT.

UNITED KINGDOM.—The *Labour Gazette* for March reported a slight improvement in the general state of employment. Compared with a year ago, a better tone prevails in the coal, iron and steel, and cotton industries, but the engineering, shipbuilding, building, and certain other groups of trades have not shared the betterment. On the Tyne and Wear, trade prospects are good, but at Liverpool and Birkenhead fresh orders are awaited with some anxiety. The Boiler Makers' and Iron and Steel Shipbuilders' Society, in their report, give some sensible and straightforward advice to their members. "During the extreme busy time of the past three years, some have grown careless, conducting themselves as if such a thing as bad trade was only an unpleasant dream and not a reality. The inclination to cease work without justifiable reason on the part of a few of our members has also had its ill-effect, and brings discredit upon us all when the Society's undertaking with the employers is that, pending the settlement of disputed jobs, work should be proceeded with. A pledge given should at all times be kept. A manly course should be adopted by a chance being given to your officials to settle."

The development which has recently taken place in the tin-plate trade is worthy of special mention. The *Labour Gazette* for March states that employment is good and much better than a year ago. At the end of February 386 mills were at work (including those engaged in the manufacture of black plates) compared with 278 a year ago. It is now reported from South Wales that there are but two works idle on the list, and that one of these, which possesses 8 or 10 mills, will be shortly restarted. All are fully booked for some months ahead.

In the recent discussions respecting trade unionism and its effect on the industries of this country, the question of the conditions prevailing in the building trade entered largely, it being stated that 400 bricks per day was as much as London builders could get out of their bricklayers. In this connection, Mr. J. C. Stewart, building manager of the British Westinghouse Electric and Manufacturing Company, has written a letter in the *Times* upon the work of bricklayers in the construction of the new building in Trafford Park, Manchester. In building the pattern shop the average performance per man per day was 1,800 bricks, and the average includes the facing work. On common work an average was reached of 2,250 bricks per man, per day. These, and similar results, were got out of English bricklayers, members of the union, directed by members of the union, and paid 11½d. per hour, or 1½d. more than the union rate. But these results are not attained without intelligence and liberality on the part of the employers. Facilities are provided for the rapid supply of bricks, and a soft mortar is used which spreads easily and allows the bricks to be imbedded with much greater ease than the stiff mortar used here. Mr. Stewart's experience is that if British workmen are to be successfully handled they must know that they are to get good wages, and the man who has charge of the work must know his business, and must have the work done in his own way, in his own time, and by his own methods. This does not only apply to bricklayers. Mr. Stewart gets his work done by British carpenters just as quickly and as cheaply as he has ever accomplished similar work in America. As he gets on with the workmen so he gets on with the unions. They do not seem to interfere with him or to want to take the management out of his hands. On the contrary, he acknowledges that his progress has been "greatly due to the interest that has been taken by the representatives of the unions in securing for him the best men that could be obtained." "What is Mr. Stewart's secret?" asks the *Times*. "Is it anything beyond the power of British masters to find out? We should say not."

COLONIES.—In the report of the Department of the Interior of CANADA, Mr. Smart says with regard to the important question of immigration, that the general result of the work for the past year has been satisfactory. There has been a substantial increase in the number of arrivals, and, according to the reports of the agents of the Department at the ports of landing and in the west, the class of settlers who have come to Canada with a view to settling on the vacant lands is a very desirable one. Although only a comparatively small proportion of the large influx of European emigration to America is directed towards Canada each year, there is no doubt that as a result of the careful selection exercised by the officers of the Department, Canada receives more than a fair proportion of the European agriculturists who arrive in America with sufficient means and experience at their disposal to locate on vacant Dominion or Crown lands and become self-supporting. As to the settlement of Manitoba and the North-West Territories only by the sons of Canadian farmers or by British settlers, Mr. Smart disapproves of the scheme. When the extent of the territory is taken into account, and also the proportion of the country which is being settled year by year, there need be little fear but that there will be plenty of land left for a number of generations of Canadians and British immigrants. The fact is that in a few years to come the various nationalities—Mennonites, Icelanders, Galicians, Doukhobors, Scandinavians, and Germans—will undoubtedly be lost in the great Canadian nationality. Over 55,000 United States settlers, with their families, settled in the North-West during the last five years, the accuracy of these figures

being fully borne out by the large percentage as shown by the returns of the persons from that country who have entered for free homesteads during that period. It is also highly satisfactory to know that the United States settler who crosses the boundary to permanently settle on Canadian soil soon becomes a fervent admirer of Canadian institutions, and fully appreciates the advantages the same offer. Commissions have been investigating the subject of Chinese and Japanese immigration into Canada, and their reports have now been made public. As was anticipated, it is recommended that the further immigration of Chinese labourers into Canada be prohibited, and a treaty is suggested to accomplish this end. In the meantime, it is proposed that the capitation tax be increased to \$500. The Commission on Japanese immigration is of opinion that if the Japanese Government puts in force its Inhibition Act, preventing emigration from Japan, this will meet all objections; if not, further legislative action by Canada will be needed, as it is held that the presence of Japanese immigrants is as detrimental to the best interests of the country as that of Chinese. Legislation on the lines of the Natal Act is suggested.

Regarding the immigration into NATAL, the Premier has announced that the Government is preparing a scheme for the settlement of suitable Europeans, and stated that he hoped the Legislative Assembly would pass a Bill this Session for the compulsory acquisition of land suitable for such a settlement. The strikes of carpenters and railway workmen continue at Durban. The railwaymen demand an increase of one shilling a day, which would involve an increased expenditure of £50,000 a year. The railway workmen agreed to return if arbitration were conceded, but the Government declined, refusing to be forced into this step. The native labour question on the Rand has taken an improved aspect, the arrangements for bringing up natives from the East Coast having worked uniformly well. During the past month they have been arriving at the rate of 1,000 a week, a good proportion coming from Northern Zoutpansberg, from which the mines drew a large supply in time past. The natives appear very willing, and prefer, it is stated, working in the mines at one shilling per diem to entering the service of the municipality at 1s. 8d. per day. The mining industry is now well on the way to its normal rate of production, but white labour is plentiful.

FOREIGN COUNTRIES.—In an exhaustive report on labour conditions in MEXICO, published by the Department of Labour at Washington, Dr. Weyl deals very thoroughly with the immigration question. Hitherto the total result of the attempt to promote immigration has been inconsiderable. No great movement of labour from Europe has taken place, and the agriculture, mining and other industries of the country have been compelled to rely practically upon the native labour force. The demand for labour, however, has rapidly increased with the activity in all branches of industry, and this demand for labour and the small result attained by attempting to stimulate the Indian to increased effort, have caused the need for immigration to become particularly acute and urgent. The problem of inducing immigration from Europe is one of the greatest difficulty. The would-be immigrant, unless he belongs to the class of skilled workmen, is confronted with the prospect of competition with a population with a lower standard of life than his own, and earning wages which (expressed in gold at least) are considerably below what he can earn in the home country. The wages paid to agricultural labourers in Mexico are not apt to be much of an incentive to the prospective immigrant from Germany or Italy. Mexico has a greater probability of obtaining immigrants from the latter country, however, than from any other European country. Italy, with its prolific population, is turning out immense numbers of emigrants, and is peopling, to a considerable extent, the available territory in Latin America, the bulk, at present, going to Argentina, which offers more attraction. Employers have turned their attention to China as a source for obtaining unskilled labour, but opinion is divided as to the advisability of this course of action. At all events, Asiatic immigration is more likely to occur than European. While, however, no great immigration of unskilled labour may be anticipated, it is probable that a certain number of foreign workers will always be in demand for the more skilled occupations. In the Republic there is quite a number of Americans, Spaniards, Frenchmen, Germans and Italians employed in occupations which require a certain degree of skill, and the demand for such labour as cannot well be done by Mexicans, while not great, is at all events intense. According to the reports of the Italian Minister in Mexico, the field for employment of comparatively cheap Italian labour is very good, especially if the persons who go there, whether agriculturists, horticulturists, miners, railway employees or persons engaged in trade, are good workmen and specialists. The field, however, is not entirely attractive, since the wages at start are not very high, and all reports agree that no one should be encouraged to go to Mexico unless he is satisfied to commence with a small salary, and endure discomforts, if not privations, to which he may not have been accustomed at home. There is demand, however, for mechanical operatives—blacksmiths, masons, stonecutters, electricians, and other persons engaged in skilled work of any sort. In concluding his report, Dr. Weyl states that, upon the whole, the most encouraging view of Mexican labour is to be obtained by considering not the actual conditions, but the probable effect of tendencies now at work. These tendencies appear to be almost entirely in the direction of an improvement in the conditions of the labouring population, and while the progress which has been made has been exaggerated by many writers, and while the real wages of the population have not increased as rapidly as many persons have stated, there can be no doubt that all the tendencies at work are favouring the growth of an independent and intelligent working class.

SCIENTIFIC AND TECHNICAL DEPARTMENT OF THE IMPERIAL INSTITUTE.

REPORT ON SPECIMENS OF FIVE KINDS OF WOOD FROM LAGOS.

(By MR. HERBERT STONE, F.L.S., F.R.C.I.)

The following report on specimens of Lagos woods has been received from MR. HERBERT STONE, one of the Imperial Institute expert referees on timbers:—

Through the kindness of the Governor of Lagos I have received specimens of five different kinds of wood from that neighbourhood, a few notes upon which may be of interest. The specimens were sent in response to a memorandum of mine which was transmitted to the Governor of Lagos by the Secretary of State for the Colonies whose support I was fortunate enough to secure. As the specimens were intended for a scientific purpose, *i.e.* the placing on record of the anatomical characters in order that the species may be identified when required, they are not of sufficient dimensions to permit of a thorough examination from a technical point of view, yet, as all but one are new to the English market, even the meagre information I am able to afford may be of service.

EKKI.—This is the well-known "African oak," a wood of great hardness and density, and of a deep red colour. The pores on a vertical section are filled with a white deposit which contrast sharply with the deep colour of the ground and on transverse section appear as scattered whitish dots; amongst these are great numbers of concentric rings of light-coloured tissue which make their appearance on the vertical section as fine loops and zigzag lines. It is a first-class heavy fancy wood and, as there is a market for it already, it may be sent here without risk.

IROKO.—This is possibly a species of *Psychotria*, to which genus the structure points. It is a brown wood, uniform in colour, being only relieved by the pores which appear hoary from their borders of lighter coloured soft tissue. It weighs 39½ lb. per cubic foot, is straight, coarse and open grained, and has a little lustre. It is easy to work, a trifle hard to saw and plane. The grain during planing picks up one way of the grain, but a smooth surface can readily be obtained the other. It will not take a good finish, owing to the unusual circumstance that ridges arise along the pores which become more prominent the longer the polishing is continued. Apart from merits which it may possess for structural purposes (of which the specimen is insufficient to permit one to judge), it may be said that this wood will meet with considerable difficulty in getting a footing on the English market, as there is little in its appearance to recommend it as a furniture wood.

OGANWO, and another unnamed species of mahogany closely allied to the Genus *Cedrela*. Both these are practically indistinguishable from Assinee or Axim mahogany and would readily be accepted here as "African mahogany." In both working and appearance they resemble that wood. The weight per cubic foot of Oganwo is 34½ lb., and that of the other 35 lb.; both are very deep in colour, their surface is lustrous and their pores are free from white deposit. They are two very excellent woods which should prove remunerative to import.

OPEPE is a curious wood, unlike any other, both as regards structure and appearance. It is of a beautiful gold colour, most agreeable to the eye; rather coarse and open grained, but extremely compact, dense and rather hard. Its surface has no lustre and feels smooth and rather cold as does boxwood. This compactness and smoothness makes it easy to polish to a fine finish; spirit polish does not spoil the colour. Weight 47½ lb. per cubic foot. I think it would meet with a welcome here, but there is not the same certainty as in the case of the foregoing species of mahogany; it depends so much upon taste. I think that it would eventually find a place after undergoing the same probation as other furniture woods having no striking merit, that is, to be imported for a time at a loss. Opepe is an excellent wood to work and leaves the tools quite smooth; even the saw leaves a clean surface, while it scarcely requires touching after the plane. It cuts and saws much more easily than its hardness would lead one to expect. I imagine that its breaking point would be low, as it appears to be short-grained and brittle.

THE ELECTRO-CHEMICAL AND ELECTRO-METALLURGICAL INDUSTRIES.

The extent to which electrical methods are at present being utilized in manufacturing operations has already been indicated in this JOURNAL (Vol. VII, p. 96), where a review of the most important electro-chemical and electro-metallurgical industries was given. The information contained therein may be supplemented by a few details concerning the progress made during 1901, the necessary data for which are furnished by Mr. J. B. C. Kershaw, in *The Electrician* (Vol. XLVIII, pp. 421, 462). Before dealing with the individual industries, it may be stated that last year's operations resulted in varying success in the different branches, for while the works producing aluminium, alkalies and bleach, sodium and sodium peroxide, and nickel all show slight increases in number and capacity, yet, on the other hand, the chlorate, copper, hypochlorite and zinc industries are all stationary, and for the moment their development appears to be checked. As anticipated in the previous article, the production of calcium carbide showed a marked decline owing to the heavy fall in price, which occurred through the supplies exceeding the demand, and many of the works formerly engaged in the industry have either been closed or are being devoted to the production of other high temperature products, such as ferro-chrome, ferro-silicon and similar alloys.

Aluminium.—The number of works producing this metal has been increased from eight to nine by the completion of the works at Shawinigan Falls, Canada. The latter, which has been erected by the Pittsburg Reduction Company of Niagara, possesses generating plant equal to 6,000 h.p. and is employing the Hall process, utilizing the Canadian deposits of corundum for raw material. The total production of aluminium during the year is a little uncertain, as the European manufacturers still refuse to furnish figures of their output, but it probably amounts to 7,500 tons. The selling price has remained practically unaltered in America during the year at about £150 per ton, but the British Aluminium Company have greatly reduced their price, and in November last quoted ingot metal of 98 to 99 per cent. aluminium at £130 per ton. No very striking development occurred in the utilization of aluminium, but the employment of the metal and its alloys is steadily growing. The recent fall in the price of copper, if permanent, will, however, probably check the use of aluminium for electrical transmission, since, if the cost of the two metals is about the same, copper will be generally preferred. The use of aluminium in foundry work still remains one of the most important of its applications, while plates of the metal are being largely employed in place of stone for lithographic purposes in Germany and America, and there is an increasing demand for the alloys for motor-car construction. It may be noted that the Goldschmidt method of producing high temperatures for welding, by means of a mixture of aluminium and ferric oxide, (IMP. INST. JOURN., Vol. VI., p. 293), has undergone further improvement and is now available for repairing broken propeller shafts in mid-ocean, an application which will probably prove of considerable importance. The most important of the new patents relating to the manufacture of aluminium are (1) a new method, introduced by Hall, of preparing the raw bauxite for the electrolytic bath, and (2) an electrolytic method of purifying the crude metal. The application of the British Aluminium Company for an extension of the life of the British Héroult patent has been refused, and their monopoly of production will therefore cease during the present year.

Copper.—The heavy fall in the price of copper which occurred during the year, owing to the collapse of the American syndicate, had the effect of diminishing the output, and, in consequence, the amount of the metal electrolytically refined will show a slight decrease from that of the previous year, when 210,000 tons, or 44 per cent. of the total, were thus treated. There were 37 refineries in operation during the year as against 42 in 1900. The works at Papenburg, in Germany, and in New Jersey, U.S.A., where copper is being extracted electrolytically direct from the ores, are still in operation, but the success of the processes is not yet fully established.

Nickel.—Considerable development has taken place during the year in connection with the nickel industry in the Sudbury district of Canada, where three mining companies are now at work. Of these the Canadian Copper Company and the Mond Nickel Company ship the concentrated matte to New Jersey and Swansea respectively, and in the latter case works have been erected at Clydach for the extraction of the metal by the Mond process. The Lake Superior Power Company are, however, treating the ore on the spot, and large works have been erected at Sault Sainte Marie, where the Clergue process of manufacturing ferro-nickel alloys direct from the ores by means of an electric furnace will be tried. In connection with this a nickel steel rail and plate mill is also being built for an output of 1,000 tons per day. In 1900 the Sudbury district produced ores containing 3,212 tons of nickel, but during last year the output of 3 per cent. ore was 700 tons per day, equal to a total of 6,000 tons of nickel. The Frasch nickel process is still undergoing trial at Hamilton, Ontario, but no information has been published concerning the progress made during the year. The only new development in connection with the working of the nickel ore of New Caledonia has been the erection of smelting and refining works at Newcastle, New South Wales, and in the latter colony itself extensive beds of ore are said to have been discovered.

Zinc.—There is very little to be recorded concerning the electrolytic zinc industry during 1901, as the fall in price of all the metals usually associated with zinc in its ores has checked development. The Hoepfner process is still in successful operation at Winnington, in Cheshire, and the method of Swinburne and Ashcroft is now to be tried upon a manufacturing scale at Weston Point. A new method of treating zinc ores is reported from Italy, by which the metal is volatilised by smelting in an electric furnace, the yield being given as 1 kilogram of zinc per 2 E.H.P. hours.

Calcium Carbide.—During 1900 there were over 100 carbide works in existence, but, as already stated, the large over-production has resulted in many of these being closed or devoted to other purposes. On the Continent, however, the price of carbide has continued low—at a little above £10 per ton, so that the accumulated stocks have not yet been disposed of—but the Acetylene Illuminating Company, who control the English market, still quote £19 per ton for delivery in the United Kingdom. The low price of carbide has given a considerable impetus to the acetylene gas industry and the number of lighting stations for small towns and villages is steadily increasing, both here and on the Continent. Another application to which calcium carbide has been put is as a germicide in the vineyards of Italy and France, where tests extending over three years are said to have proved its value for combating phylloxera. Carbide dust, which is sold at 10 f. per 100 kg., is used for the purpose, and that prepared from lime containing a high percentage of phosphates is found to be most effective, since it gives off a greater quantity of phosphoretted hydrogen on exposure, and the latter appears to be the real germicide.

Chemical Products.—The works engaged in the production of alkalis and bleach were increased by one during the year, now numbering 31, and in several cases extensions were made. The Castner-Kellner mercury process and the secret process of the "Electron" Company appear to be the most successful methods in operation on a large scale and, together, produce two-thirds of the total output of electrolytic soda. A new method known as the "gravity" or "bell" process is, however, being tried in Germany and Austria and, up to the present, has given very promising results. It is said to be a simple process in which diaphragms are entirely done away with and a current efficiency of 86 per cent. is obtained in the cells. The production of chlorates by electrical processes has not showed much development, as the low prices which now obtain (3½d. per lb. for potassium chlorate and 3¼d. per lb. for sodium chlorate) have made the manufacture much less remunerative than formerly. The number of works remained stationary at eleven, and the output is estimated at 9,000 tons. There is little to be recorded concerning the production of hypochlorites and bleaching solutions by electrolysis. Such processes are almost entirely confined to Germany and Austria, and the trials which were being made at Bradford, with a view to the introduction of the method here, have been abandoned.

Miscellaneous Products.—Some of the other products obtained electrolytically are of growing importance, and are worthy of mention. Carborundum and artificial graphite are being produced in increasing quantities; the manufacture of compressed oxygen and hydrogen for industrial purposes by the electrolysis of water is also being taken up, and at present ten such installations are successfully at work. The Groth system of electrolytic tanning is in operation at Wem, in Shropshire, and at Wenersborg, in Sweden, while other large tanneries are about to give it a trial. The electrolytic methods of refining silver and parting gold are now being used in many bullion refineries. The new methods of manufacturing sodium and sodium peroxide have almost completely superseded the older processes, and magnesium is now being produced in a similar way; and, finally, the electric furnace is constantly receiving further practical applications.

THE MINERAL PRODUCTION OF THE BRITISH EMPIRE.

The concluding section of the Report on Mines and Quarries (Part IV.—Colonial and Foreign Statistics) for the year 1900, which has just been issued from the Home Office, gives a general survey of the mining industries of the world and permits us to compare the mineral production of the British Empire with that of foreign countries. The similar report of the previous year was also summarised in this JOURNAL (Vol. VII., p. 68), and the account there given may be referred to for purposes of comparison.

In the United Kingdom itself there were 4,148 mines in operation during 1900, finding employment for 814,517 persons, an increase of 138 mines and 50,351 persons employed, over the figures of the previous year; the number of quarries under official inspection, *i.e.*, those more than 20 feet deep, was 6,959, employing a total of 93,895 persons, a decrease of 35 quarries and 4,100 persons employed from the figures of 1899. The death rate through accidents at all the mines was 1·29 per 1,000 compared with 1·27 per 1,000 for each of the two previous years, while that in the quarries was 1·39 per 1,000 against 1·19 and 1·00 for the two preceding years. The total value of all the minerals obtained from the workings is estimated at £135,957,676, while the value of the metals obtainable by smelting from the ores raised is given as £21,030,719, compared with £97,470,296 and £18,314,750 in 1899, or £77,415,063 and £13,717,512 in 1898. The large increase in the value of the minerals raised during 1900 over that of the previous year was principally due to the higher price of coal, for while the output of this was increased by a little over five million tons the value rose no less than £38,171,469. The exports were, however, in no way checked by the rise in price and amounted to 44,089,197 tons, exclusive of two million tons of coke and patent fuel, being an increase of nearly three million tons over the previous year. Compared with coal, which now represents 89 per cent. of the total value of all the minerals raised, the other mining industries are of little importance. It may be noted, however, that the production of iron ore in 1900 shows a slight decrease in quantity, but an increase in value, while the out-

put of gold from Wales has risen from 3,327 oz., valued at £12,086, in 1899 to 14,004 oz., valued at £52,147, in 1900.

The contributions of the various parts of the British Empire to the world's production of coal and the most important metals during 1900 are shown in the following table, the quantities being given in kilograms and metric tons for comparison with the world's output, but it must be borne in mind that the figures do not represent the amount of the different metals actually produced in each country, but the amount represented by the ore mined in that country.

	Fine Gold.	Fine Silver.	Coal.	Iron.	Copper.	Lead.	Tin.	Zinc.
	Kilos.	Kilos.	Metric Tons.	Metric Tons.	Metric Tons.	Metric Tons.	Metric Tons.	Metric Tons.
Great Britain & Ireland	415	5,936	228,794,919	4,741,835	777	24,755	4,336	9,211
British Borneo	684	—	51,257	—	—	—	—	—
British Guiana	3,002	—	—	—	—	—	—	—
British New Guinea	238	—	—	—	—	—	—	—
Canada	41,700	138,302	4,837,291	32,103	8,582	28,654	—	97
Cape Colony	4	—	201,636	—	6,700	—	—	—
Federated Malay States	478	—	—	—	—	—	43,123	—
Gold Coast	374	—	—	—	—	—	—	—
India	13,852	—	6,216,882	25,500	2	—	45	—
Natal (including Zululand)	—	—	245,203	—	—	—	—	—
Newfoundland	75	—	—	180,434	2,928	—	—	—
New South Wales	8,746	315,261	5,595,879	—	6,310	4,888	925	4,100
New Zealand	10,541	10,154	1,111,546	—	1	—	—	—
Queensland	21,027	3,514	505,110	—	340	208	742	—
Rhodesia	2,860	—	—	—	—	—	—	—
South Australia	603	311	—	—	5,400	1,300	8	9
Tasmania	2,244	108,560	43,700	1,549	9,766	13,347	1,832	—
Transvaal	14,704	—	—	—	—	—	—	—
Victoria	23,647	—	214,992	—	—	—	45	—
Western Australia	43,297	894	120,310	6,220	630	51	568	—
Total for British Empire	188,491	582,932	247,938,725	4,987,641	41,456	73,203	51,624	13,417
Total for the World	393,196	5,874,284	767,636,204	40,427,435	534,735	787,841	80,643	446,373
Total for British Empire, 1899	170,287*	620,975	239,995,148	5,230,063	34,507	50,964	47,148	25,120
Total for the World, 1899	476,714	5,445,594	723,239,177	39,135,752	507,047	676,116	74,281	510,701

* Exclusive of the Transvaal.

Gold.—The gold production of the British Empire is now very much larger than that of any other country, amounting to nearly one-half of the total, and it will probably increase. Excluding the Transvaal, which appears in the table for the first time, and the figures for which give the output from November, 1899 to May, 1900, the production of gold during 1900 was 3,500 kilos. greater than in the previous year. The most notable increases are those of Canada, from 31,670 to 41,700 kilos., and of India, from 12,616 to 13,852 kilos., while, on the other hand, the total output from the Australian colonies diminished, the largest decrease being in New South Wales, from 12,827 to 8,746 kilos.

The large increase in the Canadian production is chiefly due to the working of the Klondike goldfields, the output from which rose by 303,580 oz. to a total of 1,077,649 oz., or more than four-fifths of the output of the Dominion. British Columbia also shows a substantial increase, yielding 231,089 oz., and the production in Nova Scotia is also higher. There is also reason to believe that gold-mining will become an important industry in Ontario, though at the present time the production is not very large. During 1900 Canada occupied the second place among the gold-producing colonies, its output being only 1,529 kilos. below that of Western Australia, and the importance of the industry is indicated by the fact that gold represented 43·8 per cent. of the total value of the entire mineral production. In India gold-mining is almost confined to the mines in Mysore, the amount obtained elsewhere being insignificant, and the value of the output is nearly double that of the coal. Of the Australian colonies Western Australia is still the largest producer, but the remarkable increase which has occurred during the two previous years has been checked, and the returns show a decrease of 3·8 per cent. in the output. As some of the newer fields are increasing their returns, however, it is hoped that the diminution is only temporary. The East Coolgardie field produced 737,971 oz., or nearly half the total; the Mount Margaret field 145,689 oz., and the Murchison, North Coolgardie and Coolgardie fields each produced rather more than 100,000 oz. Victoria occupies the second place among the Australasian colonies, for although its output of bar gold was less than that of Queensland, the latter has a lower degree of fineness and represents a smaller amount of fine gold. The most important Queensland field is that of Charters Towers, producing nearly half the total output, but the metal obtained here is of poor quality, only averaging 62 per cent. of fine gold, whereas the Mount Morgan field, which comes next in importance, yields a far purer gold. The returns of the other colonies call for no special notice, but it may be mentioned that the method of dredging river-beds for gold, which has been so successfully employed in New Zealand, is now to be tried in several other places. In New Zealand at the end of March 1901, there were 145 of these dredges at work, and 122 under construction; at the end of 1900 there were 22 dredging plants in operation in New South Wales, and the method is being applied in British Guiana, British New Guinea and in Canada. Outside the British Empire the chief gold-producing country is the United States, with an output of 119,913 kilos., leaving 84,792 kilos. as the production of the rest of the world.

Silver.—The production of silver in British possessions has diminished by 38,000 kilos. during the year, and now only forms one-tenth of the world's total. Canada and Tasmania have increased their output, the former to a large extent, but there has been a large decrease in the production of New South Wales which has more than counterbalanced the other gains. Mexico and the United States are the largest producers of silver, the outputs being 1,923,331 and 1,862,829 kilos. respectively, or together nearly two-thirds of the world's total.

Coal.—The British Empire as a whole still produces more coal than any other single country, although the United Kingdom itself now occupies second place to the United States. During the year under review the total British output was 247,938,725 metric tons, nearly one-third of the whole, but of this the colonies only contributed 19,143,806 tons. The total increase over the previous year was 7,943,577 tons, of which however the colonial share was 2,775,432 tons, representing an increase in their production of nearly 17 per cent. during the year. India, New South Wales, Canada and New Zealand are the largest contributors, together producing more than 17,700,000 tons. The output of India is increasing rapidly and now stands at 6,216,882 metric tons, of which about three-fourths are mined in Bengal. The imports of coal, chiefly British, only amount to 333,000 tons annually, so that the production is nearly sufficient to supply the wants of the country. The other three colonies also show substantial increases in their coal production; New South Wales possesses the most important Australian coalfields, and its output is over five-and-a-half million tons; in Canada the most important fields are situated in Nova Scotia and British Columbia, which produce about 64 and 29 per cent. respectively of the Dominion's output, while in New Zealand, where 167 collieries were at work in 1900, the largest mines are near Westport on the west coast of Middle Island. The amount of coal obtained in the other colonies is

small, and the only feature of note is the fact that Western Australia has more than doubled its output since the previous year. This was due to the opening up of the Collie coalfield, where three collieries are now at work. Of foreign countries the largest coal producers are the United States and Germany, which furnish 244,901,839 and 149,788,256 metric tons respectively.

Iron.—The amount of iron ore obtained in the colonies is small and the total shows a decrease, owing to a diminution in the home production. Out of a total of 4,987,641 metric tons the colonies only supplied 245,806 tons, this being a slight increase on their contribution of the previous year. The output from Newfoundland showed a considerable increase, but that from Canada was much less than in 1899. The countries producing more iron than the United Kingdom are the United States and Spain, their outputs being 14,014,475 and 5,626,410 metric tons respectively.

Copper.—The British Empire does not produce a large quantity of copper, its output being only one-thirteenth of the total, but the amount was considerably increased during 1900, owing probably to the high price of the metal. The quantity rose from 34,507 metric tons in 1899, to 41,456 tons in 1900, and for this increase Canada and Tasmania were chiefly responsible. In the latter colony the most important source of copper ore is the Mount Lyell Mine on the west coast, and the output increased from 6,157 metric tons in 1899 to 9,766 tons in 1900. The United States is by far the largest producer of copper, yielding 275,000 metric tons in 1900.

Lead.—The amount of this metal supplied by British Possessions was increased in 1900 by over 20,000 metric tons, owing to a large increase in the Canadian production, and formed a little less than one-tenth of the world's supply. Great Britain also supplied 24,755 metric tons, and the other chief contributor is Tasmania with an output of 13,347 tons. The world's chief producers are the United States, Spain and Germany, with outputs of 245,757, 203,744 and 121,513 metric tons respectively.

Tin.—Of this metal the British Empire contributed more than five-eighths of the world's supply, the chief source of ore being the Federated Malay States, which supplied 43,123 metric tons of tin out of a world's total of 80,643 metric tons. The greater part of the ore raised there is treated at Singapore, which has now the largest tin-smelting works in the world. Great Britain produces more than any of the other colonies and the Tasmanian output has slightly declined. Of foreign countries the chief producers of tin are the Dutch East Indies, Bolivia and Siam.

Zinc.—The production of this metal in the British Empire underwent a decrease of nearly 50 per cent. during the year under review, owing to a drop in the output of New South Wales from 16,272 metric tons in 1899, to 4,100 tons in 1900. Great Britain itself produced 9,211 tons, but the supplies obtained from the other colonies are insignificant. The world's chief producers are Germany and the United States, with outputs of 153,350 and 112,419 metric tons respectively.

ALUMINIUM AND ITS ALLOYS.

The production of pure aluminium upon a commercial scale has opened a wide field for investigation, since not only the metal itself but also its alloys possess properties which render them of great value for many purposes. The metal gives rise to an enormous number of alloys, some of which, containing one or two per cent. of other metals, combine the lightness of aluminium with greater hardness and strength, while, on the other hand, many metals are greatly improved for certain purposes by the addition of from one to ten per cent. of aluminium. The former may be classed as light aluminium alloys; the latter as heavy aluminium alloys. At the present time the metal and some of its light alloys are being largely used, instead of copper, as electric conductors for long distance transmission; and consequently the determination of the tensile properties, the change in length due to differences of temperature and the electrical conductivity of these was of considerable importance, especially as the addition to aluminium of copper, zinc, nickel and iron, in quantities up to two per cent., increases the tensile strength at the expense of the conductivity. Prof. E. Wilson, M.I.E.E., of King's College, London, has carried out such an investigation on 24 light aluminium alloys and gave an account of his results, some of which had already been published, at a recent meeting of the Society of Arts (*Journ. Soc. Arts*, Vol. L, p. 54).

The purest commercial aluminium contains about 99.5 per cent. of the metal, the remainder consisting of iron and silicon, and its specific gravity at 15° C. varies from 2.56, when cast in sand, to 2.71 when hammered or drawn. Its colour is found to vary with the method of casting; if cast in chill moulds and cooled quickly or in green sand at a low temperature the metal has a bright white colour nearly like that of silver, but if cast too hot in dry sand the colour is grey, like lead, or bluish like zinc. It can be melted in plumbago or sand crucibles without becoming brittle or taking up silicon, provided the temperature does not greatly exceed its melting point, 626° C., and when used for castings the shrinkage is 0.2 in. to the foot, as compared with 0.187 in. for copper. The annealing must be done in a closed muffle, as it is very essential that the metal should not come in contact with the open fire. The hardness depends upon the purity, the purest metal being the softest, and ordinary 98 per cent. aluminium about as hard as copper, but may be increased by working.

The results of the tests are summarised in the following table, so that the influence of the different metals added can be easily seen, while the corresponding figures for hard-drawn copper are added for comparison. The breaking load and limit of elasticity were in each case determined with wire of .126 in. diameter.

—	Composition.	Specific resistance in legal ohms at 15° C.	Temperature coefficient.	Co-efficient of linear expansion between 16° & 100° C.	Breaking load in lb. per sq. in.	Limit of elasticity in lb. per sq. in.
Copper . . .	—	1.695 × 10 ⁻⁶	—	.000017	62,700	27,000 ¹
Aluminium . .	{ Containing .31 p.c. iron & .14 p.c. silicon }	2.762 × 10 ⁻⁶	.00393	.000023	28,200	19,376 ²
ALLOYS.—						
Copper . . .	1.5 to 2 p.c. of copper	3.3 × 10 ⁻⁶	.0030	.000024	40,000	33,000 ³
Nickel . . .	2.2 p.c. of nickel .	—	—	—	38,600	20,300
Nickel-Copper .	{ 1.29 p.c. nickel & 1.08 p.c. copper }	3.41 × 10 ⁻⁶	.00178	.0000252	45,900	36,600 ⁴
Nickel-Iron . .	{ 1.39 p.c. nickel & 2.6 p.c. iron . . }	3.24 × 10 ⁻⁶	.0032	.0000222	42,200	24,400
Nickel-Zinc . .	{ .83 p.c. nickel & .9 p.c. zinc . . }	3.03 × 10 ⁻⁶	—	—	—	— ⁵
Iron-Manganese	{ .56 p.c. iron & 1.78 p.c. manganese . }	—	—	—	35,300	24,400 ⁶

¹ Percentage extension of .10 with 7.2 tons applied per sq. in.
² Percentage extension of .19 with 7.2 tons applied per sq. in.
³ Little is gained in tensile strength by increasing the copper from 1.5 to 2.5 per cent.
⁴ Percentage extension of .146 with 7.2 tons applied per sq. in.
⁵ Five of these alloys were tested; the maximum breaking load was 36,000 lb., and the limit of elasticity remained low.
⁶ Specific resistance was high.

In addition to the above some zinc and copper-zinc alloys were also tested. In the zinc alloys the conductivity was greater than in those containing copper in the same proportion, and the co-efficient of expansion fell slightly with increase of zinc, whereas it rose with increase of copper; the alloy containing 2 per cent. of zinc has a lower conductivity than that containing only 1.2 per cent. The two copper-zinc alloys examined did not exhibit any noteworthy properties.

With reference to the use of aluminium for electric transmission it will be seen from the above figures that, as the specific gravity of copper is 3.37 times that of aluminium, the conductivity of equal weights of aluminium and copper is as 2 to 1, or for equal conductivity half the weight of the former would be required. The ratio of the diameters of an aluminium and a copper wire of the same total conductivity is as 1.27 to 1, or of the cross-sectional area as 1.61 to 1, and at recent prices the cost is slightly in favour of aluminium, besides which the reduction in weight involves a great saving in transport and for overhead wires fewer and lighter poles are required. When aluminium was first utilized as an overhead conductor some difficulty was experienced in several places owing to excessive breakages, but with improvements in manufacture this appears to have been entirely done away with and the most recently erected lines have successfully withstood very severe storms. As far as the effects due to gravity and temperature are concerned, aluminium is just as advantageous as copper, since its lightness and greater percentage extension counterbalance the effect of its greater linear expansion, and, in fact, with regard to the elastic limit the factor of safety is greater than in copper under the same conditions. For small single wires where great tensile strength is needed the nickel-copper alloys, which have a limit of elasticity exceeding that of copper, might be employed with advantage, though the conductivity is lower than that of pure aluminium, but for large, single- or stranded conductors the latter should prove sufficiently strong. Whether overhead aluminium wires are liable to corrosion on exposure is a matter of great importance, and careful observations are being made at many places in order to decide this. Professor Wilson exhibited a specimen which had been in use for four years at Foyers and was very little affected, but, on the other hand, some experiments made by Mr. Kershaw (*IMP. INST. JOURN.*, Vol. VII., p. 41) appear to show that the air of manufacturing towns has a much greater influence. Up to the present, however, no serious action has been observed on any of the established lines.

The employment of aluminium has in the past presented one great drawback, viz., the difficulty of soldering it, and many methods have been introduced for overcoming this, such as the use of a sleeve-joint for wires, a method of electric welding, and the Cowper-Coles process, of which details have not been given. The difficulty appears to be chiefly due to the slight film of oxide which forms upon the surface of the metal on exposure to air, and which must be broken up by scratching with a wire brush, while the surface is covered with the molten solder. If this procedure is followed the operation becomes quite easy with a solder of the following composition:—28 parts of block tin, 14 of phosphor-tin (10 per cent. phosphorus) 3.5 of lead, and 7 of spelter.

The chief heavy aluminium alloys at present in use are the aluminium bronzes, which usually contain from 8 to 12 per cent. of aluminium and 92 to 88 per cent. of copper. These possess a golden colour, are non-corrodible, and as strong as steel, being extensively employed for propeller blades, rudder frames and in hydraulic work. The breaking load varies from 34 to 44 tons per square inch, according to the composition of the alloy, and they have a high elastic limit and transverse strength. For forgings or stampings four classes of bronze are recommended, containing respectively 10, 7.5, 5, and 2.5 per cent. of aluminium (the rest being copper); the specific gravity of these varies from 7.6 to 8.3, and the tensile strength from 30 to 20 tons per square inch.

THE WORK OF THE GERMAN COLONIAL ECONOMIC INSTITUTE.

The colonies and dependencies belonging to the German Empire, although comparatively insignificant in total area and possessing at present but a small volume of trade, bid fair in the future to become important commercial centres, owing to the care with which their resources are being surveyed with a view to ultimate utilization to the greatest advantage of the colonies concerned. It will be sufficient in this connection to mention the systematic mineralogical and botanical surveys now being made in German West and East Africa, and the establishment in the latter colony of a State Department charged with the thorough investigation of new natural products of all kinds and the determination of their exact commercial value.

This anxiety to develop commercial relations with the colonies is not, however, confined to the German Government, as is shown by the formation a few years ago of the Kolonial-Wirtschaftliches Komitee of Berlin, on the initiative of a number of gentlemen connected with academic institutions in Germany. This body, which receives no financial help from the Government, carries out in Germany work similar to that of the Scientific and Technical Department of the Imperial Institute and of Kew Gardens, but of course on a very much smaller scale.

Its work is organised by an elected executive council, and the funds are provided by subscriptions from members who, in return, have the privilege of attending certain meetings and of receiving free the official publications of the society.

An idea of the work carried out by this body may perhaps best be obtained from the yearly report issued for 1900-1901. This commences with a concise statement of colonial development during the year, giving particulars regarding new companies formed for the exploitation of colonial products, dividends paid by companies already at work, and other similar matter.

The society employs a chemist and a botanist who examine and report upon products submitted by colonial correspondents. Among the materials so examined during last year may be mentioned rubber derived from a species of *Ficus* occurring in the Cameroons, gums from German W. Africa, which were found to be excellent substitutes for Soudanese gum, various gutta-perchas collected in S. America, tobacco cultivated in the Cameroon district, and maize and potatoes from German South-West Africa. In addition a number of substances were submitted to commercial experts, such as divi-divi pods from S.W. Africa, which were valued at 10s. per cwt., 'kapok' a fibre derived from *Calotropis procera* (this material has already been investigated in the Scientific Department of the Imperial Institute), the gums already referred to, which do not appear to have greatly impressed the experts to whom they were sent, a specimen of Manila hemp from Ponape, sisal hemp from New Guinea and ramie fibre from the Cameroons.

The chemical investigations so far undertaken appear to be of a very superficial nature, and comparatively few substances of unknown character are submitted for examination, a condition which is perhaps due to the fact that the German colonies are of recent acquisition, and attention is at present being devoted rather to products already well known than to materials for which some application may eventually be found. The work, therefore, differs somewhat in character from that of the Scientific Department of the Imperial Institute, where in addition to the examination of commercial products such as those mentioned above, which is constantly going on, investigations into more difficult subjects such as the invention of processes for the utilization of tan-stuffs, resins and gums which in their natural conditions present some objectional features from a manufacturer's or consumer's point of view, have

also to be undertaken. These often involve a determination of the chemical constitution of the substances present in the materials, from which definite and reliable results can only be slowly accumulated.

The botanical work done by the society consists in the importation of seeds and cuttings of plants likely to furnish useful products, into the colonies. A complete list showing the importations of such materials during the past year is given in the report already referred to, with the name of the country of origin and their destinations. Central and South America appear to have been largely laid under contribution last year, and among the better known plants obtained thence may be mentioned several gum-yielding species of *Acacia*, *Caesalpinias*, the fruits of which are used as tanning materials, *Capsicum annuum* from which chillies are obtained, quebracho, orange, chayote, pomegranate, as well as several rubber and gutta-percha plants. From India were obtained seeds of *Acacia catechu*, which yields the black catechu of commerce, *Acacia glauca* and *Modesia* which furnish gums of the Arabic type, *Albizia lebbek*, *Tectona grandis* (teak), *Casuarina species* and other valuable timber trees. A considerable number of medicinal plants, such as the castor oil, camphor, coca (yielding the valuable alkaloid cocaine), cinchona, curcuma (turmeric), cassia and tamarind, were also secured in India and Burma.

This branch of the Society's work is identical with part of that carried on in the British Empire by Kew Gardens and the various botanical gardens in the colonies affiliated to the former and in constant communication with it.

This work of the German Institute is organised almost on the same lines as those on which it is conducted in this country, but in the branch to which it devotes most attention there appears to be no counterpart in Great Britain, viz., in the equipment of expeditions to explore colonies for new products. Such work is done in this country by private firms for the articles in which they are interested, and the Foreign Office reports from certain countries occasionally chronicle the arrival of an expert sent by some enterprising firm to study the local supplies of certain materials. It is probable, however, that much help could be given to small manufacturers in this country if exact information on sources of supply were secured in this way by experts whose reports would be available for general use.

Several of these expeditions are organised by the German Society every year; thus, last year, a botanist spent two months in German S.W. Africa investigating the best methods of cultivating and preparing rubber obtained from the roots of certain trees, whilst a second expert explored the central portion of German East Africa for gum-yielding plants, fibres, tanning materials, and medicinal plants, especially strophanthus, and at the present time Dr. Stuhlman, director of Agriculture in this colony, is in India studying the cultivation of teak, cinchona, and sun hemp.

Similar expeditions are at present investigating the cultivation of cotton in the chief cotton-yielding districts of the world, with a view to the extensive cultivation of this staple in Togoland; and another left Germany in December, 1900, to study the cultivation of gutta-percha, rubber, sago, gambier, tapioca, etc., in the South Seas, and especially in Singapore and Malacca.

Full reports of several of the expeditions undertaken in former years have been published, such as that of Dr. Preuss to Central and South America, which resulted in the rich collection of seeds of economic plants, of which mention has already been made, and that of Mr. Schlechter, when the rubber-yielding plants of W. Africa were studied.

The collections made by the various expeditions are exhibited usually in Berlin, and are finally deposited with the Colonial Museum, although small collections of typical products are freely sent to schools and colleges for the instruction of students.

The results of the chemical, botanical, and other investigations are printed in the official journal, *Der Tropenpflanzer*, which appears monthly, and consists usually of about thirty octavo pages, and contains, in addition to the above matters, special articles on the German colonies, their management, and utilization, together with notes of progress. The current prices of most natural products at Hamburg are also given, though the value of such information is rather problematical, since prices a month old are of little use to dealers.

Supplements to this paper also occasionally appear dealing with specially interesting topics; for example, the supplement for January of this year, contains an excellent account of the climate, government and natural resources of Anatolia, the country through which the German railway, described in Turkish official circles as the *Chemin de Fer Ottoman d'Anatolie*, will run, and provides intending settlers with full information regarding the district.

An "address book" giving the addresses of German dealers in natural products in all parts of the world, is also published, and contains, in addition, particulars of the best routes to the colonies and freight rates, as far as these can be known, of most shipping companies.

Readers who are conversant with the work of the various departments of the Imperial Institute will see that the organisation of the German Society is planned on the same lines, the modifications introduced being such as are necessary in the cases of colonies whose resources are not so well explored as those of Great Britain.

TWO DISEASES OF CACAO TREES.

The occurrence of the disease known as "thrips" on the cacao trees of Guadeloupe has been reported upon by M. Aug. Eloit, who states that the insect causing the disease is widely distributed among the cacao plantations. The pest was the subject of an article in the *West Indian Bulletin*, Vol. II. pp. 175-190, where its occurrence in Grenada, St. Vincent, St. Lucia and Dominica was noted, with a description of its habits and distribution in Grenada. The damage to the cacao trees is sometimes insignificant, sometimes great, according to climatic conditions, drought and neglect rendering the trees very liable to an attack. Experience shows that while proper care of the trees will do much to avert the disease, ultimate reliance must be placed on spraying the trees with kerosene emulsion. The insect appears to be closely allied to the "thrips" affecting cacao in Ceylon, both the Grenada and Ceylon larvæ being characterised by a transverse crimson band.

Professor Giard, to whom an insect has been sent, has named it *Physopus rubrocincta*, though it has been hitherto regarded as belonging to the genus *Heliothrips*. The geographical distribution, as known at present, is Grenada, St. Vincent, St. Lucia, Dominica, Guadeloupe and Ceylon. It is not improbable that the insect will be found to occur in other parts of the West Indies and South America.

A short time ago, attention was drawn to another disease which attacks cacao trees in Surinam, producing bunches of malformed twigs called "witch brooms." In 1900, Professor Bos, of Amsterdam, discovered asci, or fruiting organs, of the *Exoascus* type, on the under side of two rudimentary leaves on the twigs of the "witch brooms," from which he concluded that the disease was due to a new fungus, related to those which produce "witch brooms" in other trees and which he named *Exoascus theobromæ*. Professor Went, of the University of Utrecht, has found that in cacao trees containing "witch brooms," the pods are attacked by a fungus which causes a swelling at the side, and finally produces a worthless, hard and woody pod. He considers that the fungus causing this malformation, may be allied to that which produces the swelling, but since, up to the present, no spores have been observed, the identification of the fungus has been unsuccessful. The planters in Surinam find it advisable to cut out the "witch brooms" as soon as they are observed. This method is sufficient to keep the disease from making much headway, but, if carried on to a large extent, will undoubtedly impair the productiveness of the trees.

LECTURES AND PAPERS.

"THE OBSTACLES TO DEVELOPMENT IN WEST AFRICA."

(By C. F. HARFORD-BATTERSBY, Esq., M.D.)

Admiral Sir JOHN DALRYMPLE HAY presided on the 17th February at a lecture given at the Institute by Dr. C. F. HARFORD-BATTERSBY, Principal of Livingstone College, on "The Obstacles to Development in West Africa."

Although the obstacles to development in West Africa were beyond the necessity of proof, the lecturer deprecated the adoption of a pessimistic attitude with regard to West African matters. The history of the British Empire was, to a great extent, but the record of obstacles surmounted, and he trusted that many of the difficulties that stood in the way of West African progress might, at any rate, be considerably mitigated.

Before giving an account of the two main obstacles—the liquor traffic and the malaria question—the lecturer referred to some of the minor impediments, one of the chief of which had been the apathy with which, in the past, West African matters had been regarded. This indifference, however, no longer existed. There were, at the present time, three weekly papers devoted entirely to West African interests, and, if only the divers forces which were at work in this great region could unite, there was good hope of beneficial results. Reference was here made to the African Society, recently founded in memory of the late Miss Kingsley.

One of the initial difficulties which struck the traveller on his first voyage to West Africa was that of landing. With the exception of Sierra Leone, there was not a good harbour on the coast, and, on account of the surf, landing could only be effected by means of special boats known as surf boats.

Away from the great rivers the only method of transport, in most parts of the country, was still that of human carriers. Roads and railways were, therefore, of the utmost importance, and attention was now being given to the matter. Three lines—the Sierra Leone, the Gold Coast, and the Lagos—were being constructed, and several views were shown illustrating the difficulties, arising out of the nature of the country, with which the contractors had had to contend.

The labour question had been another source of trouble, and this was important with regard, not only to the building of railways, but also to the general development of the country. It was clear that the African must be encouraged to work by making him appreciate the advantages that would accrue to himself therefrom. The lecturer here referred to the recent action of Lord Milner in South Africa in this connection, and hoped that those in authority in West Africa would profit from the experience that they might derive from South Africa.

Beside the need of unskilled labour, West African progress was hampered by the dearth of trained workmen in various industrial pursuits, and the lack of suitable industrial schools had been a serious drawback. Happily, however, this want was being remedied by the establishment of training schools, notably the industrial mission set on foot by Bishop Tugwell on the Niger; which promised to have far-reaching results, and where, in addition to carpentering and building, it was hoped that an agricultural department would be instituted. The Government were also taking up this question of agriculture.

The matter, however, which vitally affected the whole prosperity of the African Continent was the introduction of the liquor traffic among the native races. Only ten years ago this traffic formed a very considerable proportion of the trade of England with her West African possessions. Since then, however, a considerable improvement had taken place. In Lagos, for example, in 1891 20 per cent. of the imports had consisted of liquor, in 1901 the proportion had fallen to 9 per cent. Even from a business point of view, the liquor traffic among the native races did not pay. Where the natives got drink, in most cases they wanted nothing else. Desire for articles of civilised life absolutely did not exist in those who drank imported spirits, and such men would not work longer than would suffice to enable them to get the amount of spirits they required. A diminution of the drink-bill did not, therefore, necessarily mean a loss to the British traders, as it might, and indeed statistics had proved that it had done so, be accompanied by a more than proportionate increase in the demand for other articles. A number of views were shown illustrating the demoralising effect that spirits, chiefly gin, had on the natives. Perhaps, said the lecturer, the best way to make his audience realise how inimical the trade was to all real progress, moral or material, in that part of the world was to draw attention to the fact that gin, in many parts, was still almost the only currency, and that labourers, until quite recently, had usually been paid in spirits.

A general improvement, however, was taking place with regard to the drink traffic. The practice of paying wages in liquor was rapidly decreasing, other kinds of currency were being introduced, and people generally were beginning to recognise the advantages of other kinds of trade. Doubtless many agencies had been at work to bring about these results. The Native Races and Liquor Traffic United Committee, at whose request the Brussels Conference had been called, was one of the chief. This Conference had resulted in the Brussels General Act of 1891, which provided for the absolute prohibition of liquor to natives in various parts of Africa and for the general imposition of a duty of 6½d. a gallon on gin. This duty had since been advanced to 2s. 9d. and would, it was hoped, be still further increased. No measure, with the exception of the decrees for the emancipation of slaves, had had such far-reaching beneficial effects upon the welfare of the native races as this Act.

It would, however, be a great mistake to rest content with the amount of success that had been already attained. On the contrary, the lecturer considered that there never had been a time when greater vigilance was required. Africa was now being opened up in a way absolutely unprecedented in previous history, and the increase of railways, and other methods of travel, would enable drink to penetrate to places as yet uncontaminated. He spoke very strongly on this subject, and concluded this portion of the lecture by quoting some words of the late Queen to King Khama, who visited her whilst in this country. "I approve the provision excluding strong drink from your country. I feel strongly on the matter, and am glad to see the chiefs have determined to keep so great a curse from the people."

The greatest obstacle of all, however, was the unhealthiness of the country. The answer to the question "Why is West Africa unhealthy?" could be given in one word, "Malaria." Happily, however, the persevering labours of a number of scientific men of different nationalities were grappling with the ignorance that had surrounded this mysterious disease, and malaria was now as well, if not better, understood than any other important fever. What was now required was the dissemination of the knowledge thus gained as widely as possible, in order that all might join in putting into practice the methods of prevention suggested by our experts.

Dr. Harford-Battersby here gave a most interesting account of the discovery of the part played by the *anopheles* mosquito in spreading the disease among human beings. This insect, in the act of biting, discharged into the human blood the malarial poison, which, when once it entered the system in appreciable quantities, never really left it, but remained dormant in some part or other of the body, always ready, under favourable conditions, to increase to a sufficient extent to give rise to the fever.

In this connection reference was made to Major Ross, and also to Dr. Manson, under whose leadership the London School of Tropical Medicine had done such useful work, both in educating a large number of medical practitioners proceeding to different tropical climates, and taking part in various expeditions organised for investigating the subject of tropical disease. The Liverpool School of Tropical Medicine had also conducted a series of

investigations into the subject of Malaria on the West Coast of Africa, and was now engaged in carrying through important sanitary operations, besides educational work. Dr. Harford-Battersby also referred to the instruction that was being given at Livingstone College to missionaries in questions of tropical hygiene, and to the facilities afforded by the "Travellers' Health Bureau," mainly by means of the quarterly journal *Climate*, to those who might desire information with regard to what precautions should be taken in entering a tropical climate. Reference was also made to the Colonial Nursing Association, which supplied nurses for hospitals in the tropics; and also, in various parts of the lecture, to Mr. Chamberlain, who in many ways, notably with regard to improved means of transport, regulating the liquor traffic, and the health question, had done so much for the benefit of West Africa. In conclusion, the lecturer hoped that the Governments of the different colonies would take up, in real earnest, the sanitary measures necessary to carry into practical effect the important discoveries that had been made by scientific experts.

Sir John Hay, in proposing the customary vote of thanks, for what he himself had found an extremely interesting lecture, said, in referring to his own experience in West Africa, that he could look back to the time when the Hinterland was unknown. He wondered that the pest that had been so instrumental in spreading malaria should have remained undiscovered for so long, and commented upon the useful work the Colonial Nursing Association was doing in sending out nurses to the tropics. He made eulogistic reference to Mr. Chamberlain (who, in spite of the great responsibilities and anxieties of the South African war, had found time to take such useful action with regard to diminishing the evils of the gin traffic. The Livingstone College must, said Sir John in conclusion, be happy in having such a Principal as Dr. Harford-Battersby.

"BRITISH COLUMBIA."

(By the Hon. J. H. TURNER.)

The Hon. J. H. TURNER, Agent-General for British Columbia, delivered a lecture at the Institute on the 24th February, on British Columbia. The chairman, Mr. WATERLOW, in his introductory remarks, mentioned that Mr. Turner had first gone to British Columbia some 40 years ago, had served the province in various capacities, had entered the first Volunteer British Columbia Regiment in 1864, had been Mayor of Victoria, Minister of Finance and Premier of the Province.

It would be a mistake, said Mr. TURNER, to consider the scenery and climate of the province other than as part of its resources; in fact they were both very important resources, and the beautiful scenery and healthy climate of the province had not only induced large numbers of travellers to visit the country, but had also proved of material consideration and benefit to the lumberman, miner, fisherman, farmer and sportsman. Any stranger visiting British Columbia could not fail to be impressed with the appearance of the children, their beauty, healthiness, vigour and splendid intelligence.

The forests were a great store of wealth to the province; for while the timber supply, generally, of the North American Continent was rapidly disappearing, that of British Columbia had, as yet, been hardly touched. The forest lands of the province were estimated to cover 160,000,000 acres, most of the timber being suitable for pulp-making. So far, however, but two companies had embarked in this industry; the demand for the product however, was daily increasing throughout the world, as the material was now being put to many other uses than that of paper-making.

Pulp-mills required very great power to run them in order to grind up the heavy timber; but in British Columbia this power could be obtained in abundance from the numerous mountain torrents and rivers of the country, although up to the present but limited use had been made of it. Some of the streams, however, had already been harnessed for supplying electrical power to run street cars, work compressors and drills in the mines, and light in the streets and houses, with the result that already these conveniences and comforts of modern life were to be found, not only in the towns but also in the villages and even in isolated houses.

Mr. Turner believed that this abundant energy for the production of electricity found in British Columbia would have a wonderful effect upon the development of the mines and other industries of the province. The mines were probably the most important resource of the country, but they had been even less developed in proportion than the timber.

An interesting account was given of the mines that were already at work, and of the discoveries that had been made of the occurrence of gold, silver, and copper in the various parts of the country. Mention was made of the hydraulic mines in the Cariboo district, and also of river dredging, a method of collecting gold which had not hitherto been successful, although the river beds were known to be highly auriferous. The cause of this non-success had been attributed to errors in the construction of the dredgers; however, the kind that had been so successful in New Zealand was about to be adopted. On the coast of Vancouver Island considerable deposits of auriferous black sand had been found, and a large number of "placer" miners commenced to work on these last year, with very good results to themselves.

The low price of copper was proving prejudicial to the inferior grades of copper mines, but with improved electrical or oil-process appliances, cheapening the charges for reduction, these mines would, Mr. Turner considered, in the near future be able to be worked profitably.

Little attention had, as yet, been paid to the abundant supplies of iron ore that the province possessed. Altogether, although the mining industry of British Columbia was only just beginning to run, Mr. Turner felt confident as to its ultimate prosperity.

Very important resources of the province were its agricultural and grazing lands, eminently suited for fruit-growing, mixed farming, and dairying. The fruit grown in British Columbia was equal to any in the world, and, although the industry had only been started a few years, it was proving very successful, and a considerable quantity of fruit was being exported to the North-West and Manitoba. With regard to cattle, the country was now practically supplying its own wants and was beginning to export; although sheep, pigs and poultry were still imported, a condition of things which would soon be remedied as settlement on the farm lands increased.

The great wants of the country were capital and population. The population was now nearly double what it had been ten years ago, and would increase at a much greater rate if only more capital were forthcoming to develop the timber, mineral, and other resources of the province. The development of so vast a country was, however, a matter of considerable difficulty, and great expenditure was required for making roads, trails, and bridges, for surveys and for building school-houses; as by such works only could the country be fairly opened up. A great deal, however, was now being done every year by these means. Thousands of miles of roads and trails had been built. Laws had been passed to grant bonuses to railways, and about a thousand miles of new lines had been so provided for, and these, if they were constructed, would greatly increase the prosperity of the province.

Standing as it did at the gateway of the Empire to the Western oceans, and possessing such enormous supplies of the resources of modern life, and having so healthy a climate, the future of British Columbia was, Mr. Turner maintained, to become the Britain of the Pacific.

A very interesting portion of the lecture was that devoted to the advantages the country afforded as a tourist resort. Many thousands of pounds were spent yearly by the British people among foreigners in visiting the Continent of Europe, or Egypt, or Palestine, and still more remote countries, on journeys costing as much or more than a round trip to the Pacific and back; a trip which could now be made in the most luxurious manner, owing to the

comforts of the Atlantic boats and the railways across the Dominion. Mr. Turner was most enthusiastic as to the scenery of Canada generally, and more particularly of British Columbia, especially round Vancouver, where a journey could be made in still water up the coast among islands, fiords, and inlets, which formed such a remarkable feature of the western seaboard of Canada. In support of this contention Mr. Turner quoted from the recent reports of the late Royal Tour as to the comforts of Canadian travelling and the beauty of the scenery, and he showed a number of views, notably those of the fine mountain and forest scenery.

In proposing a vote of thanks, Mr. Waterlow expressed himself confident with regard to the future of British Columbia. The mineral resources of the province were being more and more exploited, though little was known in this country about them, owing to the principal mines of copper, gold, silver, and silver lead having been exploited by American and Canadian capital. The progress of the country, during the last few years, had been very great, and it was astonishing how little was known about its vast resources in London and throughout Great Britain.

"TWO ANGLO-RUSSIAN PHILANTHROPISTS."

(By Miss VENNING.)

(ANGLO-RUSSIAN LITERARY SOCIETY.)

At a meeting on March 5, Mr. E. A. Cazalet in the chair, Miss Venning read an interesting paper entitled "Two Anglo-Russian Philanthropists."

In introducing the lecturer Mr. Cazalet said that the paper which the Society was about to hear, owed a double interest to the fact that John and Walter Venning, the two English philanthropists who had done so much for Russian prison reform, were both great-uncles of Miss Venning. The chairman had seen the monument erected at Kherson in memory of John Howard, and the Smolensky cemetery at St. Petersburg, where Walter Venning was buried, and he rejoiced to hear that a memorial in marble, executed by Miss Kathleen Shaw (who was present at the meeting), was shortly to be placed at Totnes, Devon, to the memory of the Venning brothers. He had heard of the enthusiastic way in which Prince Galitzine, who represented the Emperor at Walter Venning's funeral, had spoken of the disinterested and useful work done by John Howard and the Vennings.

The lecturer said that it was in 1793, just three years after the death of Howard, that John Venning first went to St. Petersburg, at the age of seventeen, as a member of an important Russian firm. In speaking of Howard, Miss Venning reminded the Society of the admirable monograph written by its president, Mr. Cazalet, in 1890 for the Prison Congress of St. Petersburg. The medal then conferred on him was the only distinction of the kind ever conferred on an Englishman for literary work in the Russian language.

Although Howard had done much towards bettering the state of Russian prisons, the shocking abuses which still existed aroused John Venning's indignation. It was impossible to gain any real improvement during the reign of the Czar Paul, but a new order came in with the kind and generous Alexander I. While John Venning's sympathy and interest for prison work was thus being aroused in Russia, his younger brother Walter became the friend and co-worker of Elizabeth Fry, William Allen and Samuel Hoare, as a member of the Prison Society of London, founded in 1815. He soon joined his brother in St. Petersburg, where he succeeded in establishing a Russian Society on similar lines. The Emperor appointed Prince Galitzine as its president, while the Metropolitan Philaret, the Archbishop of Tver, and Count Lieven, were among its vice-presidents. And the ladies' committee formed to visit the women prisoners consisted of representative members of Russian Society and the foreign colony.

It was sad to learn that, while still comparatively young, Walter Venning's useful work was cut short by his death from typhus, caught while visiting a prison. John Venning continued his brother's good work, but when Galitzine was replaced by the reactionary Arakcheeff, the Emperor's mind was poisoned against the Society and he was induced to withdraw his patronage, which rendered progress difficult. It was Doctor Leighton, the Czar's physician, father of Lord Leighton, who later on presented an appeal to Nicholas I. for permission to continue the work. The request was granted and the Emperor, moreover, himself became its patron.

Mr. DAVIDSON, who had lived for some time in Russia, said that he was glad to think that the labours of Howard and the Vennings had borne fruit. Immense improvements had been made in the conditions of prisoners since the days of these philanthropists. When the serfs were liberated and open courts of law established, corporeal punishment was also abolished, except in the villages where the commune system existed and the inhabitants elected their own peasant elders. He hoped that the present Emperor's new "Ukaz," abolishing banishment to Siberia, would also prove a great stride in the same direction.

Mrs. ARCHIBALD LITTLE, said that she had quite recently travelled in Russia and Siberia and had seen whole gangs of prisoners on their way to exile, although she had understood that the new "Ukaz" was supposed to be in force.

Mr. HAWES, who had but just returned from Siberia, said that he had also seen prisoners on their way from Russia. They might possibly have been convicted before the "Ukaz" had come into full force, or they might have been on their way to the penal settlement at Saghalien. The speaker had understood, however, that considerable latitude was to be allowed judges and other authorities in interpreting the meaning of the Act and in adapting it to special cases.

Mr. KINLOCH, while expressing his great appreciation of the admirable paper just read, reminded his hearers that the deplorable state of Russian prisons, so vividly described by Miss Venning, was not peculiar to that country. Howard, it should be remembered, had found just as much fault with our own prisons as with those of Russia. He also pointed out that the Emperor's new "Ukaz" was issued mostly out of consideration for the inhabitants of Siberia, in order to save them from the influx of convicts who contaminated the country.

A hearty vote of thanks to Miss Venning was passed.

It may be of general interest to state that the Anglo-Russian Literary Society has the following lectures in prospect, on the first Tuesday of every month, at three o'clock:—

April 1—"Russia and the Russians," with lime-light, by ALEXANDER KINLOCH.

May 6—"Life and Legend in Russian Pictures," by Mrs. ROSA NEWMARCH.

June 3—"A Journalist's Scamper through Siberia and Manchuria," with lime-light, by JOHN FOSTER FRASER.

July 1—Mereshkovsky's "Resurrection of the Gods," by Miss HELEN H. COLVILL (Katharine Wylde).

The Condition of Samoa.—Last year was not a prosperous one for Samoa, owing chiefly to a decline in the yield of copra and a consequent fall in the sales of goods by the local merchants. The total exports amounted to £35,760, against about £50,000 in 1900, while the imports were £69,655, against about £80,000. Copra is at present the sole export. Cacao cultivation is still in its infancy, and the export of this article cannot attain any importance for another five years. The native population of German Samoa is 32,000, and of American Samoa 6,000, while there are about 400 foreigners and 400 half-castes. The drawback to planting at present is that the German authorities only allow leases for ten years; but, in the opinion of the British Vice-Consul at Apia, if the term is extended to 40 years, or if purchase from the Samoans be allowed, a large field will be opened for the profitable employment of capital. Nearly all the imports are from Australia, New Zealand, and San Francisco, except soft goods, which are largely of German origin. The natives both in German and American Samoa seem to be satisfied with the new order of things; there is no good opening at present for either planting or trading, although much money is being spent by the authorities on public works. British shipping forms about six-sevenths of the whole tonnage trading to the islands.

PROCEEDINGS OF INSTITUTIONS.

THE ROYAL AGRICULTURAL SOCIETY OF ENGLAND.

The usual monthly meeting of the Council was held on the 5th ult., Prince Christian (president) in the chair. Three new governors were elected, and 32 candidates were elected members of the Society. Lord Wenlock was elected a member of the Council, in the room of Mr. C. S. Mainwaring, resigned.

Progress in the arrangements for the Society's meeting of 1902, to be held at Carlisle from July 5 to 11 next, was reported. The entries in the implement department close on the 15th ult., and the final date for the receipt of entries of stock, poultry, and produce at ordinary fees is April 15.

A scheme by the Society's consulting chemist for the experimental treatment of two acres of a field in Hertfordshire badly infested with wild onion, the experiments to extend over four or five years, had been approved, and a grant was made to the Botanical Committee for the necessary expenses connected with these experiments.

The Hon. Cecil T. Parker, from the Veterinary Committee, presented a report by Professor McFadyean, which stated that during the second four weeks of the year 68 outbreaks of anthrax had been reported, with 127 animals attacked, as against 53 outbreaks and 76 animals attacked in the corresponding period of last year. During the same four weeks the reported outbreaks of glanders had numbered 77 and the animals attacked 151, as against 97 and 169 respectively during the corresponding period of last year. The outbreaks for the same period of swine-fever had been 115, as against 159 in 1901. During the last four weeks two reported cases of rabies had been experimentally verified; making a total of three since the beginning of the year. All of these had occurred in Wales. The experiments on the possibility of infecting bovine animals with tuberculous material from the human subject had been continued at the Royal Veterinary College during the past month, and a final report regarding them would be presented at the next meeting.

The following resolution was passed and ordered to be transmitted to the Board of Agriculture:—"The Council of the Royal Agricultural Society of England, while approving the limit of 16 per cent. of water suggested to be prescribed for butter by the Departmental Committee on Butter Regulations, learn with much apprehension the view of the committee that butter containing a higher percentage of water will escape the operation of the above limitation if disclosure be made of the fact beforehand. They would especially regret the making of any regulation which would admit of 'milk-blended butter,' or similar mixtures not of the true nature of butter, being sold under any description implying that they were butter, or with the word 'butter' attached to them."

Various reports were presented, and the Council adjourned until Wednesday, April 9.

THE SOCIETY OF ARTS.

Mr. T. W. Holderness, C.S.I., secretary of the Revenue Department, India Office, read a paper at the Society of Arts, on the 13th ult., on "The Indian Famine of 1899, and the Measures Taken to Meet it." The chair was taken by Sir Antony MacDonnell, president of the recent Famine Commission, and formerly Lieutenant-Governor of the North-West Provinces.

Mr. Holderness, at the outset of his paper, said it was almost a truism to explain that, thanks to improved communications and to the development of irrigation in Upper and Northern India, a "famine" in modern India no longer denoted an absolute dearth of food. The drought of 1899 was the greatest in extent and intensity which India had experienced during the last 200 years. The official estimate which computed the crop losses of British India in 1899-1900 at about £50,000,000 was, if anything, under the mark, while those in the native States might be put at about £20,000,000. Describing the relief problem as it presented itself in the autumn of 1899, he said that, while in British India the situation presented some exceptional difficulties, in native States it was grave and complicated in the last degree. The direct expenditure on the famine in British India amounted, up to March 31, 1901, to £6,300,000. Agricultural loans and advances amounted to £1,200,000. Loss of revenue and indirect expenditure were estimated at £2,700,000, after taking credit for £700,000 accruing to the Government as additional receipts from railways and canals. The total expenditure and revenue losses of the native States might be placed at between £7,000,000 and £8,000,000. In regard to the question of mortality, the Famine Commission came to the conclusion that the excess deaths in British India due to the famine were about 1½ millions. In the native States affected by the famine there was a population of 42,000,000 in 1891, and there was now a population only of 36,000,000, while in the States not visited by the famine the population had increased by over 12 per cent. He thought the experiences of the late famine should suggest to native States the expediency of maintaining a financial reserve to meet the drain of similar future calamities.

The chairman, in opening the discussion which followed, said Mr. Holderness's remark that a famine in India no longer meant an absolute dearth of food connoted one of the most remarkable achievements of recent Indian administration. It was not long ago that an Indian famine meant an absolute dearth of food. It meant that in the famine in Orissa in 1866, and still more in that of Madras in 1877; but in the last two famines, those of 1897 and 1899-1900, there never was want of food in any famine-stricken district, only want of money with which to buy it. Owing especially to the system of protected railways, it was an easy matter now to transfer surplus stock from the granary districts to those where it was wanted. But no famine relief in India would be entirely satisfactory which, in preserving the people's lives, failed to preserve also their self-respect and their habits of industry, and he especially urged the importance of strict economy in relief distribution in the interest, not of the taxpayer, but of the people themselves. The real difficulties of India were not difficulties of taxation or climate, but those arising out of social conditions.

Sir William Wedderburn said the efforts of the Government should be directed to improving the economic condition of the cultivator.

In a paper on "Sound Signals at Sea," read before the Society on the 5th ult. LORD RAYLEIGH being in the chair, Mr. E. PRICE-EDWARDS gave some account of the experiments carried out last year by a special committee of the Trinity-house at the fog-signal station on St. Catherine's Point, in the Isle of Wight. The observations were begun on May 8 and were continued until June 13, and no fewer than 4,600 were recorded and tabulated. The committee decided to confine their attention to sound signals only, considering that the various electrical methods of communicating with befogged vessels proposed to them were not sufficiently developed for practical trial.

The lecturer remarked that the real value of a sound signal to the mariner in a fog was, that he could form a fairly approximate idea of the direction from which it proceeded, and was thus able to keep away from it. But with signals conveyed by ætheric vibrations or wireless telegraphy, though he might be informed of the name of the station, he could not tell in what direction it lay, nor could he get any idea of how far it was distant. The instrumental trials at St. Catherine's Point were largely devoted to comparisons of efficiency between the siren principle and the reed principle of producing sounds. The trial of a new form of 7 inch disc siren, with a very low note, gave some interesting results. On one occasion, in fine clear weather, with a light easterly wind, it was audible at a distance of over 20 miles, while the sounds of the higher-pitched cylinder sirens were lost at half the distance.

But, on another day, when the force of the wind was four and the sea was rough, the low-pitched note was at a disadvantage, and was lost at 1¼ miles.

The reed horn, as now developed, must be regarded as inferior to the siren as a sound producer, yet the committee thought it must be admitted that it had its advantages in situations where a sound signal of small range would be serviceable, or where there was no space sufficient for the machinery necessary for sirens. As regards the trumpets associated with the sounding instruments, the lecturer described the elliptical forms suggested by Lord Rayleigh, and pointed out the importance of using trumpets, the proper notes of which were in unison with those of the sound producers.

He went on to discuss the effect of certain atmospheric influences, such as wind and fog, on the propagation of sound, and mentioned the curious "silent areas" which were noticed on several occasions during the experiments, the sounds beginning to die away at a distance of about a mile from the siren or horn until they were very faint, or perhaps inaudible, and then recovering their strength when the three miles line had been passed.

In opening the discussion, Lord Rayleigh remarked that accumulated experience might in time enable the receiver of a signal transmitted by wireless telegraphy to tell from what distance it was being sent, while it was still an open question how far information could be gained as to the direction whence it came.

THE ROYAL GEOGRAPHICAL SOCIETY.

At the meeting held on the 10th ult., under the presidency of SIR CLEMENTS MARKHAM, PROFESSOR W. M. RAMSAY read a paper on "The Geographical Conditions Determining History and Religion in Asia Minor." He said that if geography was to be regarded as the study of the influence which the physical features and situation of a country exerted on the people who lived in it, then in no country could geography be studied so well as in Asia Minor. The physical features of the country were strongly marked; its situation was peculiar and unique; its history could be observed over a long series of centuries, and amid its infinite variety there was always a strongly-marked unity and certain clear principles of evolution, standing in obvious relation to the geographical surroundings.

He described the Anatolian peninsula, which stretched like a bridge between Asia and Europe, and referred in considerable detail to its history. The development had always been in the action and collision of forces moving eastwards or westwards; it had been simply the series of phases in the immemorial conflict between Europe and Asia. It was not merely armies or migration of peoples which had swept eastwards or westwards across Anatolia, but art, knowledge, new thoughts and new religions had trodden the same path in either direction. But there was a growing opinion among the most recent investigators, an opinion which Professor Ramsay said he strongly held himself, that Anatolia was not merely an intermediary, developing foreign ideas in a practical way, but a country which had also played a not unimportant part as an originator.

Anatolia was once the centre of a great empire exerting an influence on the outer world, and it was closely connected with the most fascinating and the most obscure historical problems which were at the present time under discussion. Every step that was being made in the discovery of the early Greek world and the history of early intercourse in the Eastern Mediterranean lands constituted at the same time, indirectly, an advance in the history of the ancient Anatolian world. Twenty years ago the Anatolian empire was not even dreamed about by anybody; even yet it was almost an unknown quantity. The subject now had an acknowledged place in every modern discussion about the early Mediterranean world, and after ten or twenty years it would occupy far greater space than it did now. An ancient system of writing in hieroglyphics, different from any other known system of expressing thought by visible and permanent symbols, was known in Asia Minor through a long process of development, and was dimly traceable as an influence on other countries. Characteristic Anatolian artistic forms had been studied and specified by several investigators.

Speaking of the influence of Anatolian religion on the Greek and Roman world, he said that one feature in the Anatolian religion was prominent and impressive at the first glance. The ordinary and familiar idea was that God was the Father of all mankind and all life. Such was the almost universal European and Semitic conception. But it was the motherhood of the Divine nature that was the great feature in the Anatolian worship. The male element in the Divine nature was recognised only as an occasional and subsidiary actor in the drama of nature and of life. In the social customs of Anatolia, even after it was overspread by Greek manners and Greek ideas, many traces remained of that primitive idea. Descent was sometimes reckoned through the mother; women magistrates were frequently found even in the Hellenized cities of the land. And in its history the same impression remained; it was everywhere the most pathetic of histories. The earliest known trace of the veneration of the Virgin Mary in the Christian religion was in a Phrygian inscription of the second century; and the earliest example of a holy place consecrated to the Mother of God as already an almost Divine personality was at Ephesus early in the fifth century. Of the many movements of thought that had occurred along the great bridge, the only one which could be traced in any detail was that by which Christianity was diffused over the country and into Europe.

COMMERCIAL INTELLIGENCE DEPARTMENT.

CORRESPONDENCE AND ENQUIRIES.

The following are given as specimens of some of the enquiries which have been addressed to, and satisfactorily answered by, the Institute during the past month (March).

** * All communications must be authenticated by the name and address of the writer. Enquiries which would involve special applications or expense will be a matter of arrangement with the correspondent.*

- E. S., *France*.—Names of cotton oil refiners in London.
- C. H. A., *Kent*.—Nin Oil.
- W. S. E., *Scotland*.—General information on Uganda.
- R. K. B., *India*.—Books on tobacco manufacture.
- H. D., *Yorkshire*.—Makers of fire brigade appliances and apparatus.
- L. A. F., *India*.—Ostrich farming.
- Verbal.—Trade in New Zealand.
- „ Brique-making machinery.

REQUIREMENTS REGISTRY.

In order to provide correspondents with an opportunity of making known special "wants" or "needs" in the British Colonies, India, and Foreign Countries, space will be regularly devoted to the publication of approved notices in the IMPERIAL INSTITUTE JOURNAL. Notices, as a rule, should not exceed 25 words in length, for which a charge of 2s. 6d. will be made for each insertion. Special arrangements can be made for longer notices.

SPECIMENS OF FOREIGN AND COLONIAL WOODS desired. Purchase or exchange. Names and localities must be well authenticated. Address—HERBERT STONE, BRACEBRIDGE-STREET, BIRMINGHAM.

THE CURATOR OF THE CANADIAN SECTION OF THE IMPERIAL INSTITUTE is prepared to furnish information about Canadian Trade and to supply names of importers, manufacturers, shippers, etc.

The following trade enquiries have been received at the Canadian Section of the Imperial Institute, from the Curator of which Section further particulars may be obtained:—

Home Enquiries.—A London firm wish to be placed in correspondence with Canadian saw mills which can supply packing-case shooks in quantity.

A Liverpool firm ask for the names of the leading Canadian mining companies who use cyanide of potassium.

An enquiry has been received from a firm of London merchants for the names of Canadian producers and shippers of high-grade feldspar.

A firm of merchants wish to be placed in communication with Canadian manufacturers of doors and mouldings in quantity seeking an export outlet. They are in a position to contract for the output of one or more factories.

A Liverpool firm desire the names of Canadian producers of black ash and basswood boards, also of birch chair seats.

A London firm wish to hear from Canadian lumber manufacturers who can contract for regular supplies of basswood boards cut to lengths and glued together.

An enquiry has been made for the names of Canadian manufacturers of excelsior.

Canadian Enquiries.—A Canadian manufacturer of cutlery asks to be placed in communication with United Kingdom firms importing foreign-made cutlery, particularly for export trade, who might be prepared to deal in Canadian scissors, knives, etc.

A Canadian manufacturer of flooring of various kinds invites correspondence from United Kingdom importers of same.

A manufacturer's agent, resident in Vancouver, British Columbia, wishes to secure the representation of a manufacturer of window and other glass.

A New Brunswick manufacturer of hard-wood of various sorts, who can supply same cut strictly to patterns rough finished, wishes to establish a connection in the United Kingdom.

A Canadian company dealing in grocers' and druggists' supplies, novelties, etc., is prepared to act as resident agent for United Kingdom manufacturers of these goods.

A Montreal manufacturers' agent, who can furnish good references, seeks a few agencies in groceries and provisions, etc.

Foreign Enquiry.—A firm in Brussels (Belgium) desire names of Canadian shippers of feldspar of good quality.

MAPS AND CHARTS.—RECORDS.

[The entire collection of maps (with the exception of a few atlases and maps issued by private firms) consists of authoritative publications of the various government cartographical departments. Such as: the One-inch Ordnance Survey of Great Britain and Ireland, a complete set of Admiralty Charts, and a selection from the maps compiled in the Intelligence Division of the War Office; the monumental "Indian Atlas," and a large number of the publications of the Surveyor-General's Office, Calcutta; the Geological Survey of Canada, and the Government Surveys of Victoria and New South Wales. In the arrangement of the collection, the geographical classification of the War Office Intelligence Department catalogue has, with some modifications, been followed.]

ADDITIONS TO THE COLLECTION OF MAPS DURING FEBRUARY, 1902.

AFRICA.

Egypt.

SUDAN SURVEY, No. 1489:—Musha, Akobo.

I.D.W.O.

Transvaal.

WITWATERSRAND GOLDFIELDS, showing the controlling interests held by the various South African Companies, 1 inch to a mile.

The Cartographic Company.

Presented by the Cartographic Company.

West Africa. No. 1539:—Nikki.

Presented by the Director-General of Mobilization and Military Intelligence.

Seychelles.

MAP of the ISLAND OF MAHE based on survey by Commander Balfour, 1890, and showing the principal landed properties as compiled by S. B. Hobbs, Island Surveyor, 1900.

Presented by the Government of Seychelles.

NORTHERN NIGERIA.

In his report on Northern Nigeria for the period from January 1, 1900 to April 1, 1901, Sir F. Lugard, the High Commissioner, after describing the location of the new headquarters near Wushih, on the Kaduna river, deals as follows with the question of railways:—

"So vast an area as Nigeria, comprising in all some 380,000 square miles (of which Northern Nigeria contains about 320,000), cannot be commercially developed except by railways. I do not here dwell on the political reasons which urge the construction of a railway in this vulnerable part of the Empire as a portion of the scheme of Imperial defence. By railway construction alone can we achieve the rapid concentration of troops and supplies which would supersede the necessity for a greatly increased local force (involving an immense and unremunerative expenditure) to guard our frontiers. Railways are also essential for purposes of internal administration, by facilitating communication. So vast a country cannot, it appears to me, be served by a single railway.

"The Lagos railway has reached Ibadan, 123 miles from the coast, and only about 150 miles of comparatively easy country now separate it from the Niger. It may be advisable to make a branch line from Ibadan to Sapele, where a good port is available (whereas it is calculated that it will cost nearly a million to remove the bar at Lagos), and the branch line would pass through a rich and populous country. In my view the question as to whether this branch line to Sapele should be made, or whether the port of Lagos should be improved, is a matter apart, to be decided by a comparison of cost and a balance of advantages, and it should not interfere with the forward progress of the line now that it has been completed as far as Ibadan. The line should be carried forward without delay to Ilorin, and whether it should be taken thence to Jebba or to Egbaji, must be decided by surveys as soon as possible. The Lagos railway, extended eventually to Kano and Katsena, would develop the western territories, and assist in their defence from possible aggression in that direction.

"An eastern railway, from the fine port of Old Calabar, would have Lake Chad as its ultimate objective, and would protect the eastern frontiers. Whether or not these views recommend themselves, it is, I think, of great importance that a railway policy should be settled, for much can be done in the way of surveys and road making to prepare the way for a coming railway, and such a definite policy would be of the utmost use to local administrators in determining the lines of development and progress. I have strongly urged the great importance of at once deciding at what point the Lagos railway shall cross the Niger, looking, on the one hand, to the magnitude of the task in bridging the river, and, on the other hand, to the comparative feasibility of alternative routes (from the point at which the line crosses) to the north towards Kano.

"No time, I think, should be lost in making these surveys, and in obtaining the best expert opinion as to the bridging work, for on that decision will largely depend the policy in the Protectorate. It may also be borne in mind that once the point at which the railway will cross the river is decided, railway material can, if desired, be more cheaply brought to that point by steamers direct from England at high river, than it could be by rail from Lagos, even when the Lagos railway reaches the river. Construction northwards and southwards (to meet the Lagos line) can be simultaneously undertaken from that point, nor indeed is it necessary to delay the forward progress till the bridge (which will be necessary eventually) is constructed. In fact, so far as the development of Northern Nigeria is concerned, the need is for a railway from the Niger banks to Kano, and not for connection with Lagos. The Lagos railway will, beyond doubt, benefit Lagos, but since Northern Nigeria has the waterway of the Niger for the export of its produce, and since water carriage is cheaper than rail, it is not clear what benefit to its trade the Lagos railway will confer. Every yard, however, of a railway from the Niger to Kano would, by superseding the present caravan transport, tend greatly to promote the development of trade."

With regard to trade competition, Sir F. Lugard says that its absence on the Niger has often been remarked, but it is necessary to bear in mind the distinction between European competition (a) in the native markets, and (b) in the supply of necessities to Government employees. As regards the former, the argument of those who hold that the policy of amalgamation of European interests in undeveloped countries is preferable to competition in the purchase of native produce deserves to be seriously considered. If fair dealing, enterprise, and energy be assured, an amalgamation of European interests may prevent the undue enhancement of prices, and enable the amalgamated trading corporation to set aside capital for the extension and development, which else would be absorbed in the struggle of competition. While the wants of a native in a primitive state remain few, enhancement of prices no doubt decreases supply, for the producers, having acquired all the goods they need, will not exert themselves to tap to the full the resources of the land. For a similar reason it would have an adverse effect upon the supply of labour, and would put up the price of the labour market, and Government being the chief employer, whether for public works, soldiers or transport, would be the principal sufferer; progress would become most costly, and the cost of administration greatly increased. Also, in spite of the clamour that the Niger should be thrown open to trade competition, Sir F. Lugard was unable, after enquiry, to discover any British firms who were willing to enter the field under the principles of free trade without bias or discrimination. The country is now open to them to reap the supposed benefits for which they have so long agitated, but none have come forward to introduce capital or competition, and, so far as could be ascertained, those traders who desired to enter Northern Nigeria have coalesced with the Niger Company, or are debarred, either by lack of capital or by pre-existing contracts, from becoming their rivals.

The competition of the small native trader is also an important matter. Sir F. Lugard was not of opinion that in Northern Nigeria the small trader from the coast would be of any great use, while he is quite certain to give much trouble in his dealings with the natives, and by his fondness for litigation. Experience has shown that, as a matter of fact, he does not travel in the interior and open up markets, but is content to remain to the full as stationary as a European. The immigrant black trader is by no means a desirable person, but every effort should be made to encourage natives of the Protectorate to become small traders and collectors of local produce.

SPONGE FISHING IN THE EASTERN MEDITERRANEAN.

An interesting report on the above subject has been transmitted to the State Department by the United States Consul at Beirut, Syria, from which we extract the following:—

SOURCES OF SUPPLY.—Greek and Turkish sponges have been known to the trade for hundreds of years. Syria furnishes, perhaps, the best quality, and shipments are made from Tripoli and Latakia to Paris, London, Trieste, Hamburg, New York and the Piræus. During the last fifteen years, however, the output has greatly diminished, owing to the introduction by Greeks, in the seventies, of diving apparatus, which proved ruinous alike to fishermen and fisheries. It is estimated that the annual exportation of Syrian sponges at present hardly exceeds \$85,000 in value. In the adjoining territorial waters of Cyprus, sponge beds are being worked with varying success. Sponges were exported from that island in 1898 to the amount of \$10,425, and in 1899 \$28,835 worth were shipped. Egypt, Barbary, Crete, Rhodes, Samos, Calymnos and other islands of the Turkish and Greek archipelagos also produce sponges for export. A large share of this trade was formerly in the hands of merchants, with headquarters in Smyrna and Trieste, but is now centred in London and the Piræus. The United States annually buys sponges abroad to the amount of about \$500,000, the principal shipments proceeding from Nassau (Bahama Islands), London and Piræus. The highest grades of sponges—the softest and finest in texture—are found principally in the Mediterranean. Some of the cheaper varieties are also found there, but none like those taken in Florida or Cuban waters. All through the Mediterranean, except the western half of the northern shore, three species of sponges prevail at a depth of 2 to 100 fathoms, viz.: *Euspongia officinalis*, *Hippospongia equina* and *Euspongia zimocca*.

METHODS OF COLLECTION.—In collecting the sponges four methods are employed—harpooning, primitive diving, dredging, and diving with special outfit. With harpoons, one of the chief difficulties is to see the bottom clearly through a troubled sea. To obviate this a wooden or zinc plate cone, like a water bucket, open at the top and with a glass bottom, is used. On looking through this water glass, which is partly submerged, the bottom of the sea may be clearly studied, even at thirty fathoms, and the proper sponges picked out by the harpoonist. The primitive method of diving, with no other apparatus than a slab of stone as a sinker and a cord to communicate with the surface, is most popular in the Levant. On reaching the bottom the diver hastily snatches up as many good sponges as possible, and, after remaining under water from one to two minutes, tugs violently at the cord and is drawn to the surface. The sponges are collected in a net which the diver carries around his neck.

At greater depths, particularly along the coasts of Asia Minor, dredging is employed usually in winter, when storms have torn up the seaweeds which cover the bottom. To these simpler operations was added, some twenty-five years ago, the "skafander," or diving apparatus, which enables the diver in his submarine dress to spend an hour under water at a depth of from ten to fifteen fathoms. Experience has shown that the employment of the last two methods is a severe tax upon the sponge banks, as everything in sight—sponges large and small—is gathered. Germs and seeds also suffer greatly, and it takes years before a new crop matures. The fishermen who use the "skafander" are frequently stricken with palsy of the lower extremities, stricture, and other complaints. The abuses which so disastrously affect the Levantine sponge industry have prompted a Russian philanthropist, Professor Charles Flegel, to inaugurate a campaign for the abolition of diving apparatus in sponge fishing. Through his efforts, the authorities of Samos, Crete, and Cyprus have prohibited the use of the "skafander"; also the Governments of Italy and France, the latter acting in behalf of Tunis. The question is also being agitated in Egypt. It is said the matter will be taken up and discussed at the International Fisheries Congress, which is to be held in St. Petersburg in February and March. If the Turkish Government joins the crusade, the "skafander" will most likely have to go, and, in the absence of this "engine of destruction" a new era may dawn for sponge fishers and sponge fisheries in the Levant.

As far as known, no steps of importance have been taken to protect the sponge beds in Turkish waters. A close season has been proposed, but has not been established by law. The Government collects from each boat using the harpoon or the primitive diving system 319 piastres gold (\$14.03) a year. A skafander boat pays \$145.20 per season, and its operations are limited to eight months in the year, beginning April 1. From the drag-net boat a licence fee of \$22 is exacted.

MARKET.—At present only occasional shipments of Syrian sponges go direct to the United States. Considerable quantities, however, are bought in London and Piræus. Along the Syrian littoral the demand of merchants, especially for white sponges, exceeds the supply, and prices naturally have an upward tendency. This, in connection with West Indian competition, hinders trade with America. The introduction of antiseptic surgery has also decreased the urgent demand for the Turkish article. With the advent of regular, direct steamship facilities, however, it is likely that Syrian sponges will find a fairly responsive market in the United States. Importers are referred to Dr. Harris, United States consular agent, Tripoli, Syria.

Since making the above report, the Consul has learnt that the Egyptian Government has promulgated a decree (January 10, 1902), prohibiting the diving-bell in sponge fishing. It is also ordered that drag-nets must not be used in waters of less depth than eighty metres (292 feet). Licences for boats for harpooning and nude diving will be granted at \$25 per season, while dredging boats must pay \$50. Any vessel using diving apparatus will be confiscated and sold. Professor Flegel now announces that Samos, Crete, Cyprus, Tunis and Egypt, having banished the "skafander," Greece and Turkey will be invited to follow their example.

NEW BOOKS, etc.

GORDON AND GOTCH. (London, Melbourne, Sydney, Brisbane, Perth, Wellington, and Cape Town.) *The Australian Handbook, (incorporating New Zealand, Fiji, and New Guinea), Shippers', Importers', and Professional Directory and Business Guide for 1902.* Thirty-third year of issue, with maps, plans, etc. La. 8vo., pp. 652+191. (Price, 10s. 6d.) This useful and well-compiled year-book has acquired a wide reputation as a handy and complete work of reference on questions relating to Australasia, and the present issue has perhaps been more carefully edited than any of its predecessors. The Gazetteer portion of the work, descriptive of towns, has now been collated into one section, thus simplifying reference to any of the cities and places in the Commonwealth and New Zealand. General information, statistics of agriculture, minerals, trade and commerce, etc., are classified in connection with each of the States of the Commonwealth and New Zealand under their respective divisions. The flag and seal of the new Commonwealth will be found represented, and the names of the members of both Houses of the first Commonwealth Parliament are given. A copy of the Commonwealth Tariff Bill has been inserted with the latest amendments received. Some of the clauses of this Bill, affecting Shippers and Importers, will probably be considerably modified. The Colonial Buyer's Guide and Shippers' Directory, most useful portions of the book, have been carefully revised and, when necessary, extended. The work has become indispensable to commercial men and those having business connection with Australasia. The immense quantity and variety of information, given in a condensed form, testify to the enormous labour expended on its compilation.

HORACE MARSHALL AND SON. (London, 1901.) *India in the Nineteenth Century.* By DEMETRIUS C. BOULGER. 8vo., pp. 360. With illustrations and a map. This volume contains an account of the progress of India during the past century, a period during which the Empire has seen more changes and improvements than any previous century has brought about. The material progress of India has been enormous, and in every part of the country the benefits derived from British rule are most apparent. After preliminary chapters on the quest and conquest of India, the author describes the first epoch of reform under the Company, and our numerous wars with the Afghans and Sikhs, concluding with the annexation of the Punjab. Lord Dalhousie's administration as Governor-General, which effected many and lasting benefits to the country, receives due recognition, and this is followed by a brief, but well-written summary of the Mutiny of 1857-8, which caused so much misery, and greatly retarded the progress of the country. It, however, led to the disappearance of the East India Company and the proclamation of Queen Victoria as Empress of India. Twenty years of peace followed, interrupted by our last Afghan wars. After describing the rule of the last five viceroys, Mr. Boulger gives a summary of the material progress of India during the century, showing that there has been a great development and expansion in the resources and wealth of the country by means of railways, canals and irrigation. The social circumstances and condition of the people have greatly improved, and though famines are unfortunately still frequent, their effects have been mitigated by the improved means of communication. The author concludes with a "retrospect and a forecast" in which he advocates the formation of an Imperial council which would furnish a safe and sure mode of inter-communication between the Viceroy's Government and the responsible rulers, administrators and merchants of India. Mr. Boulger's opinions are deserving of the highest consideration, but it is to be hoped that his fears of a Russian invasion may prove groundless. He urges the raising of the Anglo-Indian garrison to the highest possible point of strength and efficiency. He says:—"We need not fear the result of any struggle with Russia if we are ready and prepared, but the desire to shirk the conclusion that such a struggle is inevitable is one of the chief reasons why Asiatics doubt our power and the issue of that contest when it comes. They do not understand our reluctance to face and admit the truth, and sometimes our forbearance is interpreted as cowardice. The safety of India depends on her being in a state of military preparedness to resist invasion, and the belief that is in that state is the best creative force of confidence and loyalty."

HORACE MARSHALL AND SON. (London, 1901.) *The Foundation of British East Africa.* By J. W. GREGORY, D.Sc. With maps and illustrations. 8vo., pp. 282. (Price, 6s. net.) This book contains a popular description of the geography, social condition and administration of British East Africa, a colony which, on account of its great natural fertility, is becoming more important every day, especially as the railway from Mombasa has now reached the Victoria Nyanza lake, and there is every prospect of new markets being opened up and trade greatly increased. Dr. Gregory's work will be read with interest, and his observations on the future of British East Africa are deserving of much consideration. He says that the primary need of our possessions in Equatorial Africa is a special service of men appointed by open competition as in the Indian Civil Service, but these men should know the country and understand its people. The separation of the management of East Africa from the ordinary work of the Foreign Office is therefore advisable, and it has been proposed to transfer it to the Colonial Office. "The main requirement for the successful administration of British East Africa is a Government that will curb militarism, raise a permanent staff of men whose hearts are in their work, scientifically develop the natural resources of the country, and enlist the systematic co-operation of the better elements of the native population." The maps and illustrations inserted in the volume will be found most useful.

JAMES M'KELVIE AND SONS. (Greenock, 1901.) *Notes on the Sugar Industry of the United Kingdom.* By JOHN M. HUTCHESON. La. 8vo., pp. 137. (Price, 5s. net.) The author of this book has been connected with the sugar trade in Greenock for fifty-three years, and this long experience has given him an intimate acquaintance with the progress and vicissitudes of the industry. The growth of the sugar trade during recent years has been very great; the consumption, as shown in a statistical table, having increased from 931,668 tons in 1880 to 1,571,357 tons in 1900. During this period the importation of cane-sugar has declined, while that of beetroot has increased enormously. Mr. Hutcheson draws attention to the great change that has taken place, since the abolition of the sugar duty in 1874, in the sources from which we procure our sugars, and in the relative weight of sugar imported. Though the sugar industry is in a declining condition, yet, with the abolition of foreign bounties, some resuscitation may be anticipated. These records of the growth of sugar-refining in the United Kingdom will be found most interesting, especially the personal notes relating to refining firms and families.

JOHN HEYWOOD. (Manchester.) *Handbook of Sierra Leone for 1901 and 1902.* Edited by A. B. C. MERRIMAN-LABOR, of the Colonial Secretary's Office, Sierra Leone. Sm. 8vo., pp. 206. (Price, 3s.) This little handbook is designed to be "a treasury of information" relating to the Colonial and Municipal Governments of Sierra Leone, its trade and commerce, religion and education, the army and navy, and every conceivable matter of interest connected with the Colony and its protectorate. It has been prepared from Government records, and may be regarded as official. The handbook will be found most useful to all who have business relations with West Africa. Some interesting and amusing particulars are given in the biographical sketches of natives of Sierra Leone.

A map showing the extension of the railway to Bo is inserted and also a view of Free-town from the harbour. Judging from the initial number this handbook is likely to have a good circulation.

JOHN MURRAY. (London, 1902.) *Speeches on Canadian Affairs.* By HENRY HOWARD MOLYNEUX, FOURTH EARL OF CARNARVON. Edited by SIR ROBERT HERBERT, G.C.B. 8vo., pp. xvi.+386. (Price, 7s. 6d. net.) This book contains speeches, mainly on Canada, by the late Lord Carnarvon, during the period from 1854 to 1887. In 1867, as Secretary of State for Colonies, Lord Carnarvon aided materially in bringing about the confederation of the provinces now forming the Dominion of Canada. Lord Carnarvon possessed an intimate acquaintance with colonial questions generally, and his speeches will be read with interest, especially that delivered in 1870, on the "Constitutional Relations of the Colonies with Great Britain," in which he expressed his views with regard to the unity of the Empire, and the necessity of closer bonds of union between the colonies and the mother-country. Lord Carnarvon's opinions and suggestions with regard to an Imperial policy have now been acted upon, and an Imperial confederation is likely to be formed. With regard to commercial relations with the colonies, he said that for many years they have been our best customers, and our Colonial Empire is one of such extent, fertility and variety of production that we could get everything we want from within its boundaries. "One of the best things we could do would be to see if we could not devise some form of commercial connection between the colonies and the mother-country." The issue of this volume at the present time is most opportune and it will well repay perusal.

KEGAN PAUL, TRENCH, TRÜBNER & CO. LTD. (London, 1902.) *The British Empire Series, Vol. v.: General.* With two maps. Large post 8vo., pp. 681. (Price, 6s.) This volume is the last of a very important series which has been designed to give reliable information regarding every portion of the British Empire. The subjects of the papers included in this final volume are of a more general and varied character than those in the preceding volumes, and embrace such topics as the "Negro in Barbados"; "The British Empire of To-day and To-morrow," by Sir C. E. Howard Vincent; "The British Navy," by J. C. Wheeler; "Naval Bases and Coaling Stations"; "The British Army"; "The Railway Systems of Greater Britain"; etc. The volume will be found most interesting, as many of the questions of the day relating to the Empire are dealt with. In an appendix there are statistics of the British Empire and colonising countries, a chronological table and census returns. The series will, no doubt, prove an admirable means of spreading a knowledge of the vast extent and the illimitable resources of our Empire.

"KNOWLEDGE" OFFICE. (London, 1902.) *Bird Hunting on the White Nile, a Naturalist's Experiences in the Soudan.* By HARRY F. WITHERBY, F.Z.S. Illustrated, 8vo., pp. 117. (Price, .) This little book, which contains some excellent and artistic photographic illustrations, gives a brief account of a recent tour in the Soudan, undertaken to add to the knowledge of the fauna of that country. It was found that mammals were exceedingly scarce, but 141 specimens of different kinds of birds were observed and collected. The account of the present condition of the country and its natives is interesting, and ornithologists will find the author's observations on the bird-life in the Soudan useful and valuable.

E. MARLBOROUGH AND CO. (London, 1902.) *Hindustani Self-taught, with English phonetic pronunciation.* By C. A. THIMM, F.R.G.S. Crown 8vo., pp. 110. (Price:—paper wrapper, 2s.; cloth, 2s. 6d.) This little book contains Hindustani idiomatic phrases and dialogues, travel-talk, military, legal, religious, commercial and sporting terms, together with tables of Indian money, weights and measures, which will be of practical service to tourists, commercial men, and others. The phonetic system of pronunciation given and the use of roman letters and spellings, instead of Hindustani characters, will help greatly in acquiring a knowledge of the language sufficient for ordinary conversational purposes.

C. MITCHELL AND CO. (London, 1903.) *The Newspaper Press Directory and Advertisers' Guide; and a Directory of Class Papers and Periodicals.* Fifty-seventh annual issue, 1902. La. 8vo., pp. 223. (Price, 2s.) This useful and well-compiled directory presents in its fifty-seventh issue all the excellent features that have appeared in previous editions. In addition this year some special articles have been added which enhance the value and interest of the work. Mr. Hugh Fraser, LL.D. contributes an article on "The Legal Year in its relation to the Press," and Mr. Moore has written one on "The Press Coronation," showing the progress made by the British Press during the reign of Queen Victoria. The Hon. W. P. Reeves, Agent-General for New Zealand, and the Hon. Sir John A. Cockburn, have written on Colonial questions, and there is also an interesting article on "The Commonwealth Tariff." Special articles will be found in the South African section and there are, in addition, the usual Trade Reviews. The compilation has been carried on with extreme care, so as to ensure accuracy. From the preface we learn that the number of newspapers now in existence in the British Isles reaches 2,457; magazines, including quarterly reviews, number 2,486, of which 508 are of a religious character. This will give some idea of the necessity of having a directory for such a vast array of publications.

SAMPSON LOW, MARSTON AND COMPANY, LTD. (London, 1902.) *Types of Naval Officers drawn from the History of the British Navy.* By A. T. MAHAN, D.C.L., LL.D., Captain United States Navy. With portraits. 8vo., pp. xiv+500. (Price, 10s. 6d.) In this book the writer of *The Influences of Sea Power on History* has supplemented his work by an account of the conditions of naval warfare at the beginning of the eighteenth century and its subsequent development during the period, as typified in the lives of six of the most distinguished British seamen who played a great part in the evolution of sea fighting and the improvement of the system which enabled Nelson to achieve his fame and save Europe from the grasp of the great Napoleon. These were the men who restored to the British Navy the supremacy of the seas, after the misadventure at Toulon in 1744, and Minorca in 1756; and the traditions handed down by them are still treasured as sacred in the British Navy. Capt. Mahan has, by this most readable volume, added greatly to his already widely known reputation and authority as a naval historian.

SONNENSCHNIG AND CO., LTD. (London, 1902.) *What's What: a Guide for To-day to life as it is and things as they are.* By HARRY QUILTER, M.A., Trin. Coll., Camb.; Barrister-at-Law. 8vo., pp. 1182. (Price, 6s.) This volume contains a vast amount of useful information concerning men, places and things in general, well selected and arranged in a handy form for reference. The criticisms and opinions of the writers are distinguished by their acumen and originality, and there is nothing dull or commonplace to be found in the pages of this work such as is frequently met with in many guide books. The "paragrams," of which there are no less than 2,500, are written in a vigorous and terse style; and include a great variety of subjects, so that ordinary readers, especially those whose reading does not extend much beyond the newspapers and magazines of the day, will find the book exceedingly interesting and instructive. The observations on art, literature and education are specially noteworthy. The illustrations, particularly the reproduction of a charming view of Amiens by David Cox, never hitherto published, enhance the attractiveness of this cleverly compiled and entertaining volume.

STUBBS' LTD. (London, 1902.) *Stubbs' Commercial Year-Book and Gazette Index, 1902.* Twenty-third Annual Issue. Containing the Registered Information for the year 1902. For subscribers only. 8vo., pp. 336. This year-book is intended for commercial men, as its chief feature is an index of the entries in the Gazettes for the year 1901. It also contains epitomes of the laws relating to cheques, payment of money, bankruptcy and partnership; the public legislation of 1901; statistics of commerce and trade, etc., which will be found useful.

THE "GAZETTEER OF INDIA."—The Secretary of State for India has appointed Mr. James S. Cotton, for many years editor of the *Academy*, to carry out the revision of the *Imperial Gazetteer of India* decided on some time ago. Mr. Cotton was the late

Sir William Hunter's chief assistant in the original compilation of the great work he is now to revise and bring up to date. His headquarters are to be at the India Office, and the writing of special sections will, as in the case of the first edition, be entrusted to expert assistants.

THE "FINANCIAL TIMES," LIMITED. (London.) *The Mining Year-Book, 1902.* Edited by A. N. JACKMAN. Introduction by J. W. BROOMHEAD. With Directories of Directors, Secretaries, Mining Engineers and Metallurgists; Glossary of Mining Terms. 8vo., pp. 1,317. (Price, 15s.) The second issue of this excellently compiled year-book shows a considerable improvement on the first edition as regards facility for reference and saving of time and trouble. The volume is prefaced by an able article on the rise and present position of mining in all the principal goldfields of the world, and a glossary of mining terms for the assistance of the general reader. An important addition to the book is the list of Mining Engineers and Metallurgists, their qualifications, the nature of their experience and where acquired, and their present addresses, telephone numbers, and telegraphic addresses. This information will be of great value to officials of mining companies. Another improvement is that a comprehensive analysis of the last statement is shown alongside the corresponding figures for the previous period. Every care appears to have been taken to make this Year-book complete, accurate, and up-to-date. The numerous additions have necessitated a considerable enlargement of the book, and the printing and typing are clear and effective. To all interested in mining, in any part of the world, the book will be of great service, and it should be very useful to mining and finance companies.

THE SCIENTIFIC PRESS LIMITED. (London, 1902.) *Burdett's Hospitals and Charities, 1902, being the Year-Book of Philanthropy and the Hospital Annual.* By Sir HENRY BURDETT, K.C.B. Thirteenth year of issue. 8vo., pp. viii+994. (Price 5s.) This useful year-book contains an exhaustive record of hospital work and a review of its position and requirements, with articles on management, expenditure, the nursing department, and special incidents and hospital construction in 1901. The book becomes more valuable each year, as the interest in hospitals and hospital work increases. The example of the King in initiating and bringing to a successful issue the Prince of Wales's Hospital Fund, now by his wish styled "King Edward's Hospital Fund," has given a great impulse to the support the hospitals receive, and all who wish them to continue to be successful are invited to subscribe to a Coronation Gift to provide a sum equal to at least £100,000 a year, secured upon invested capital and annual subscriptions, which shall be placed to the credit of this fund. This would greatly aid the carrying on of the work of the hospitals, and relieve much of the anxiety with regard to their support. Sir Henry Burdett's year-book will be of great service in giving information as to the channels in which this assistance may be most usefully directed.

CITY BRANCH OF THE IMPERIAL INSTITUTE, AT 112, CANNON STREET, LONDON, E.C.

The CITY BRANCH OF THE IMPERIAL INSTITUTE embraces:—

1. A News Room, supplied with:—

- The chief British Industrial and Commercial Periodicals;
- Many United States, German, and French Commercial Periodicals;
- Commercial Periodicals of the principal Colonies and of India;
- Market reports, prices-current, and statistics.

2. An Enquiry Office, in telephonic communication with the Commercial Information Office of the Imperial Institute at South Kensington. Enquiries relating to industrial, commercial, and other matters connected with the Colonies, India, and Foreign Countries, are received and promptly dealt with, and samples of products from the Colonies and India, stored at the Imperial Institute, can be inspected or obtained. Expert valuation will be furnished of samples submitted for that purpose.

The News Room is *free to Fellows* of the Institute, as is also the Enquiry Office for obtaining such information as does not involve special research or correspondence.

A *subscription* of the sum of one pound per annum, payable in advance, secures the *free use* of the News Room, and the supply, free of charge, of information not involving special research or correspondence.

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Non-Subscribers to the City Branch can be supplied with information upon the following terms:—

- First* enquiry, not involving special research or correspondence, *free*.
- For each subsequent enquiry, not involving special research or correspondence, one shilling.
- For each enquiry, involving special correspondence, or interviews with home-experts, etc., five shillings.
- For each enquiry involving Colonial or Foreign correspondence, ten shillings; or by special arrangement, if likely to be voluminous.

Subscribers will have to pay the charges specified under (c) and (d) in the foregoing clause: *Fellows* will only be required to reimburse the Institute any out-of-pocket expenses incurred in connection with enquiries coming under those heads.

The Information Department will undertake to obtain analytical or other examinations of samples by competent Experts, upon payment, by

persons submitting them, of the usual professional fees, to be previously specified, and agreed to by the applicant.

The Institute will undertake to procure, and supply, at cost price, translations into any language, of trade circulars, prices-current, etc., and the conversion of weights, measures, coinages, etc.

The City Branch will shortly be removed to 49, Eastcheap, E.C.

SCHOOL OF MODERN ORIENTAL STUDIES.

Founded by the Imperial Institute in union with University College and King's College, London.

In 1887 it was suggested that a school of Modern Oriental Studies should be organised as a branch of the Institute, in imitation of the very efficient establishments of this kind which are carried on, with Government resources, in France, Germany, and Austria. The promulgation of this proposal led to negotiations with the authorities of University College and King's College, London, which resulted in their co-operation with the Institute in the establishment of the School. A Special Committee having been appointed to decide upon a system of work, it was arranged that classes for instruction in the Oriental languages required by students qualifying for examinations for the Indian Civil Service, should be held at University College, while modern Oriental languages, other than the Indian languages, should be taught at King's College, and that the Imperial Institute should undertake the general administrative and financial work. The School was officially opened in January, 1890, when an inaugural address was delivered by Professor Max Müller at the Royal Institution, in the presence of His Royal Highness the Prince of Wales. The daughters of the late Colonel W. J. Ouseley (Bengal Army) have established and endowed, in his memory, three scholarships, in Arabic, Persian, Hindustani, and other Oriental languages, in connection with the School, each one of the value of not less than £50 per annum. The following Scholarships have already been awarded:—

YEAR.	SUBJECT.	EXAMINERS.	AWARDED TO.
1892	Arabic .	{ Dr. WELLS Prof. SALMONÉ	No Competitors.
1893	Arabic .	{ Dr. WELLS Mr. JOHN T. PLATTS	Mr. HENRY LEITNER, junr.
"	Persian .	{ MIRZA HUSSEIN KULI KHAN Mr. JOHN T. PLATTS	Mr. E. DENISON ROSS.
1894	Hindustani .	{ Mr. JOHN T. PLATTS Dr. ROBERT BRUCE	No Competitors.
"	Persian .	{ Sir THOMAS WADE Dr. WELLS	Mr. DIWÂN TEK CHAND.
"	Chinese .	{ Dr. WELLS Mr. J. T. PLATTS	No Competitors.
1895	Turkish .	{ Dr. WELLS Mr. J. T. PLATTS	Mr. L. STENNETT AMERY.
"	Hindustani .	{ Dr. WELLS Mr. J. T. PLATTS	Mr. ASGHAR ALI.
"	Chinese .	{ Dr. WELLS Gen. R. D. ARDAGH	No Competitors.
1896	Burmese .	{ Dr. WELLS Mr. J. W. NEILL	Mr. LEE AH YAIN.
"	Arabic .	{ Dr. WELLS Dr. S. A. KAPADIA	Mr. H. G. SARWAR.
"	Marathi .	{ Mr. J. W. NEILL Dr. S. A. KAPADIA	Mr. V. R. PANDIT.
1897	Gujarati .	{ Mr. J. T. PLATTS Mr. W. A. PICKERING, C.M.G.	Mr. RUSTUM D. N. WADIA.
"	Persian .	{ Mr. J. T. PLATTS Prof. J. F. BLUMHARDT	Mr. P. S. PATUCK.
"	Chinese .	{ Mr. W. A. PICKERING, C.M.G. Prof. J. F. BLUMHARDT	No award.
1898	Bengali .	{ Dr. WELLS Dr. WELLS	Mr. B. C. GHOSH.
"	Turkish .	{ Dr. WELLS Dr. WELLS	Lieut. A. M. SETON, R.A.
"	Chinese .	{ Dr. WELLS Dr. WELLS	No Competitors.
1899	Arabic .	{ Dr. WELLS Dr. ROSS	Mr. G. A. KHAN.
"	Persian .	{ Dr. ROSS Prof. C. BENDALL	Mr. R. M. DAVIS.
"	Sanskrit .	{ Prof. C. BENDALL Mr. J. T. PLATTS	Mr. S. K. GHOSH.
1900	Hindustani .	{ Mr. J. T. PLATTS Prof. J. W. NEILL	Mr. N. HAGOPIAN.
1901	Marathi .	{ Prof. J. W. NEILL	Mr. J. R. MARTIN.

An OUSELEY SCHOLARSHIP of £50, tenable for two years, will be awarded this year, should sufficient merit be shown, for proficiency in PERSIAN. No person will be admitted to competition for a Scholarship in a language which is his own mother tongue, nor for a Scholarship in a language allied to his mother tongue.

The examination takes place early in July, 1902.

Competitors must give notice on or before July 1, 1902.

The ages of Candidates are to be above 17 and under 25 years on January 1 of the year of examination.

Further particulars may be obtained from the Secretary, S.M.O.S., Imperial Institute, S.W.

GENERAL INFORMATION FOR INTENDING STUDENTS AT THE SCHOOL.

The classes which the "School of Modern Oriental Studies" comprises, are divided under two heads.

DIVISION I. includes classes for all Oriental Languages especially required by Students qualifying for examinations for the Indian Civil Service, the instruction being of the same character as that provided for some time past at University College and at King's College. This Division includes instruction in Sanskrit, Bengali, Hindi, Hindustani, Tamil, Telugu, Punjabi, Pali, Marathi, Gujarati, Arabic, and Persian.

DIVISION II. consists mainly of classes for Modern Oriental Languages other than the Indian Languages.

The courses of tuition are of a practical rather than of an academic character; they have particular reference to commercial and official requirements and to the facilitation of colloquial intercourse with natives of Oriental Countries.

It is in contemplation, so soon as the number of students warrants the expenditure, to secure the services of native readers and teachers of conversation in connection with the classes of this Division.

The classes under this Division are conducted at King's College, where arrangements will also be made for the establishment of evening classes.

The Languages taught in Division II. comprise Colloquial Arabic, Armenian, Modern Greek, Colloquial, Persian, Russian, Turkish, Chinese, Burmese, Japanese, Malay, and Swahili.

Arrangements have been completed by the Managing Committee and approved of by the Governing Bodies of the Imperial Institute and of the two Colleges, for the pursuit of studies relating to the history, literature, commercial and physical geography, political economy, and the natural and industrial resources, of the countries and districts in which the various languages are used.

Special Lectures or courses of Lectures will be delivered from time to time, in connection with the School, by experts or specialists, in any of the foregoing subjects.

There are three terms, of about ten weeks, in each year, as follows:—

SPRING TERM—commencing about the middle of January.

SUMMER TERM—commencing early in May.

AUTUMN TERM—commencing about the middle of October.

A fee of THREE GUINEAS per term will have to be paid, in advance, by each Student for each Language taken up for instruction. This payment will entitle the Student to the use, within the College, of text books, dictionaries, and works of reference required in connection with the particular Language taught, and to the use of all the facilities which it is proposed to secure in the development of the School.

Accommodation is provided at the Imperial Institute to enable Students to pursue their studies at hours when the classes are not held. The Libraries of both Colleges will be open to Students in any of the classes of the School, during the usual hours of study.

Intending Students should communicate with the Secretary at the offices of the Imperial Institute, London, S.W., where the registration of Students will take place, and where all information regarding the School will be supplied.

MONTHLY COMMERCIAL AND INDUSTRIAL SUMMARIES.

GENERAL COMMERCE AND INDUSTRY. COLONIES.

Angora Goats in New Zealand.—Angora goats appear to be rendering a good account of themselves in New Zealand as destroyers of briars and brambles, which spread so freely as to become veritable pests unless kept in check. These goats are already running in several parts of the colony, and are found to be particularly well suited to rough country. The Agricultural Department recently imported a number from South Australia, and these, according to the *Wellington Post*, have been doing well on Somers Island, where they were sent to undergo quarantine. There exists throughout New Zealand a considerable demand for these animals, but much difficulty is experienced in supplying it. The Turks, it seems, have prohibited their export altogether, whilst in Cape Colony a heavy export duty has been imposed. Besides their value for keeping down brambles, briars, and similar pests of the land, the goats give a good supply of rich milk, whilst from each animal it is possible to cut every year from 4 lb. to 6 lb. of mohair, worth, it is stated, from rs. 4d. to 2s. per lb. It is estimated that there are at present about four million Angora goats in Cape Colony.

Camphor Production in Ceylon.—The production of camphor has increased in Ceylon since 1900. With the high price of £10 per cwt. which is obtained in the principal producing districts of Japan in consequence of the Government monopoly, the prospects of this new product in Ceylon are very favourable. Up to the present the camphor trees in some districts of the island are growing satisfactorily, and a series of distilling experiments gave very satisfactory results.

Quebec.—PROGRESS OF SETTLEMENT.—According to the recent report of the Minister of Lands, the total area of the unceded territory of the province of Quebec (at present subdivided into farm lots) available for concession is 6,777,287 acres. During the last fiscal year 183,728 acres were sold for \$95,026. Free grants to the extent of 1,700 acres were also made on certain colonisation roads, and 10,090 acres were conceded in the same manner to fathers and mothers of twelve living children. The Minister is pleased with the fact that the past year has shown an increase in the superficial area of the lands sold or granted for colonisation purposes, and in the number of patents issued in favour of settlers who have fulfilled all the settlement conditions, which indicate a marked increase in the number of farms in all those regions of the province where colonisation is in a flourishing condition. This improvement he attributes to the remunerative prices now obtained for farm produce, to the prosperous condition of the lumber trade generally, and to the great activity with which lumbering operations are being pushed all over the province, and especially to the manufactures of pulp wood.

Queensland.—TRADE IN 1901.—The total value of Queensland imports for 1901 amounted to £6,070,706, and the exports were £8,611,044, comprising—gold, £2,544,959; hides and skins, £419,331; preserved and frozen meat, £1,290,351; pearl shell and *bêche-de-mer*, £119,792; sugar, £756,150; tallow, £213,227; tin, £114,111; wool, £2,109,068; green fruit, £101,535; all other, £942,520. Compared with the previous year, the imports show a decrease of £1,009,967, exports a decrease of £456,931. The border Customs for 1901 shows imports £259,460, and exports £454,909.

South Australia.—DISCOVERY OF PHOSPHATES.—The Government geologist, Mr. Brown, has reported to the Government regarding the discovery of phosphates in the hundred of Clinton, York's Peninsula. His investigation of the deposits leads him to believe that the quantity of rock containing a sufficient percentage of phosphate of lime to render it of commercial value, is very large, and the configuration of the country most favourable to the opening of quarries, whereby rock can be raised cheaply and expeditiously, and shipments averaging 70 per cent. tri-calcic phosphate and less than 6 per cent. iron and alumina could easily be selected. Mr. Brown says that it is most probable that deposits of phosphatic rock occur in other portions of the districts where Cambrian limestone occurs. The discovery is important, not only to South Australia, but to the Commonwealth generally, as, up to the present time, no similar deposit so likely to prove of such great commercial value has been found on this continent.

Victoria.—TRADE IN 1901.—The Custom-house statistics for December enable the returns in Victoria for 1901 to be summarised. The increase in imports amounts to a little over 3 per cent., while the rise in exports is equal to nearly 7 per cent. The imports of gold were less by £250,000, owing to the Perth Mint's operations. Wool imports were £188,000 less, but wheat, owing to the large Riverina crop, more than doubled, the rise being £121,000. In all other merchandise there was an advance of £895,000. In exports, gold dropped by £823,000, but wool was £84,000 greater. Wheat and flour advanced by £563,000, but butter fell away by £245,000, and is still declining rapidly. All other exports showed a fair advance, and, on the whole, the return is a satisfactory one.

Western Australia.—MINERAL OIL.—It is reported that there have been important developments recently in connection with the petroleum and asphalt discoveries in the vicinity of the Warren River, and that arrangements have been made to test the country and to sink a trial bore to a depth of 1,500 feet. For many years past, it is stated, settlers in the vicinity of the Warren River, which is on the southern coast of Western Australia, have known that bituminous deposits were to be found along the coast between Capes D'Entrecasteaux and the Leuwin. Along the shore masses of asphaltum were found, apparently cast up by the waves. The analyst, Mr. S. S. Dougall, F.I.C., reports that this is a singularly rich asphaltum, being, for all practical purposes, pure, only a minute portion of foreign mineral matter (dry sea sand) being present. A little further inland traces of mineral oil were found in the sand dunes, and at a distance of about three miles from the shore sandstone, saturated with petroleum oil, was found in the water-course of the Warren River.

INDIA.

Cotton-seed Machinery.—The Upper Indian Chamber of Commerce at Cawnpore desires estimates from manufacturers of cotton-seed oil machinery for a small plant complete, including machines for stripping the lint from the seed, removing the shell, grinding the kernel, and pressing the meal for oil, and also for an oil-refining plant, to include the arrangements necessary to enable the wastes given off by the oil in the process to be utilized in soap-making.

Demand for Refrigerating Machinery.—Writing from Bombay an engineering correspondent of the *Iron and Coal Trades Review* sends the following particulars of the class of refrigerator which finds extensive demand among the Indian hotels. They are comprised in the specification sent by

Mr. Tata, who is building what will be one of the largest hotels in the Far East. "(1) The refrigeration machine is to cool a cold chamber on the ground floor, about 37,500 cubic feet in space, the chamber to be maintained at about 32 degrees; (2) The machine is to make a ton of transparent ice per day in 12 hours; (3) The machine is to be capable of cooling by, say 10 to 15 degrees, twenty suites of rooms at the western extremities of the building; (4) arrangements should be made with a view to extending the cold chambers in future to include the basement. The motors for driving the refrigerating equipment are to be shunt-wound, two in number. They are to work at a potential of 100 volts and to develop 40 horse-power each at normal speed.

Indian Textiles in Seistan.—According to a report of Captain Webb-Ware, the Political Agent at Chagai, a recent inspection of the Nasrabad Bazaar showed that, excluding a Russian cloth known as shikin maghut, the textiles sold in Seistan are almost wholly of either English or Indian manufacture. Shikin maghut is a kind of moleskin cloth, which is manufactured in Russia in various qualities and shades, and forms one of the most important Russian exports to Central Asia. That this cloth appeals to the native taste is undoubted, but it is difficult to say why this should be so, for the dyes used are bad, the material is second-rate, and the prices asked are high. The Political Agent goes on to say:—"There is little doubt that if Indian manufacturers were given a fair field, they could manufacture a similar article of higher quality and sell it at a lower price in Trans-Caspia. Indian manufacturers might do well to turn their attention to the manufacture of this cloth, as it commands a ready sale on the frontier." The Political Assistant at Chagai is prepared to supply patterns on application.

Rubber Growing in Burma.—It is satisfactory to read in the Administration Report that the experimental rubber garden at Mergui was worked profitably during the year. It has only recently been started, and the fact that it already shows a profit reflects considerable credit on Mr. Ryan, the forest officer, who is in charge of it. Judging from all appearance the demand for rubber throughout the world is likely to be an increasing one, and the Government acted rightly, we think, in starting a good sized plantation at Mergui of 10,000 acres, the climate there being apparently very favourable for its growth. It would have been hopeless to expect private capitalists to undertake such a venture at the outset. But if the Government venture pays they will no doubt be glad to follow suit, and a new industry will have taken root in the province which promises to be a lucrative one.—*Rangoon Gazette*.

FOREIGN COUNTRIES.

American Coal Depot in Messina.—An American syndicate has requested the Italian Government to grant them a large piece of ground at San Raineri on the east side of the harbour of Messina. The syndicate will establish a depot for requirements of the navy and trading ships, as well as for trade purposes. The stock of coals will average about 40,000 tons.—*Handels Museum*.

British Trade with Argentina.—The imports of all kinds into Argentina in 1901 were valued at \$113,959,749. Of the countries whence these were derived, the United Kingdom ranks first for \$36,460,808, or 32 per cent. of the whole. Next come Germany, \$16,724,549, or 14.7 per cent.; United States, \$15,533,639, or 13.7 per cent.; and Italy, \$14,736,103, or 12.9 per cent.

Commercial Museum and Intelligence Departments in Bulgaria.—The Austrian Consul in Rustchuk states that the Bulgarian Ministry of Trade and Agriculture proposes to establish in Rustchuk, as well as in other important towns in Bulgaria, branches of the Bulgarian Commercial Museum and to increase by these means the utility of this museum. The Chamber of Commerce of Rustchuk resolved to follow the example of Philippolis in opening a commercial intelligence bureau.—*Handels Museum*.

Demand for Machinery in Siberia.—According to the *Bulletin Commercial* there is now an opening in Siberia for many kinds of goods not formerly sent to that country. The classes of articles most likely to find a market in eastern Siberia are, according to this statement, agricultural implements, machinery and industrial material for flour mills, oil manufactories, butter factories, distilleries, tanneries, machinery for gold, iron and coal mines, saw mills, machinery for brick fields and salt works, and machinery for manufacturing rope, paper, etc.; while the demand for wines, spirits, silk goods, furniture, books, musical instruments and jewelry is apparently small. Commercial bodies desirous of seeking an outlet for their goods in Siberia should endeavour to get into touch directly with the consumers by the establishment of large deposit warehouses, where goods could be sold both wholesale and retail. The Siberian trader is accustomed to add a large percentage on the goods he sells, so that by passing the merchandise through his hands he would obtain the greater part of the profits.

German-American Competition in Cuba.—Exports from Germany to Cuba have largely increased since the United States, in the place of the different treatment of foreign goods which were imposed by the Spaniards, has given similar duties on all goods from different countries as those from the United States. North American commercial houses think the cause of this, to them, disquieting state of affairs is that there are direct steamship lines between Germany and the harbours of Cuba, whilst the centres of trade in the north-east of the Union have no such direct steamship lines. New York exporters, therefore, put themselves into communication with shipowners for relief from this want of communication, and, as a result, a new line of steamers has been established between New York and Havana, which will also touch the sugar-exporting ports of Matanzas and Cardenas.—*Handels Museum*.

Japanese Commercial Attachés.—The Japanese Government has decided to send commercial attachés to some of the principal towns and manufacturing places, and to commence with London, New York, Tientsin, and Shanghai. Those in London and New York will be concerned with financial and general industrial matters, whilst those in Tientsin and Shanghai will only have to look after the interests of Japanese exporters and traders. An expert is to be sent to a North American town, either Boston, Philadelphia or New York, in order to report to the Japanese Government as to the customs of trade there.—*Handels Museum*.

Joint Agents in Mexico.—American merchants deal with Mexico frequently through joint representatives. Producers of various goods form a group which is represented in Mexico by one representative, who receives a fixed allowance for travelling expenses, rents, taxes, and sample dépôts. These men work exclusively for their firms, and are in a better position to serve their interests than the agents of European houses who do not receive such an allowance. Under these circumstances, it is quite to be understood that agents who previously represented European firms, will only continue to do so if they receive a similar allowance. If this is refused then they will work preferentially for North American firms.—*Handels Museum*.

Openings for Capital in Foochow.—It is mentioned by the British Consul that, as a manufacturing and mining field, Foochow has not yet been exploited, and in both respects there

are great possibilities. The establishment of the match factory and saw mills was a move in the right direction, and indications are not wanting of a serious intention on the part of the provincial authorities to examine into and utilize the unquestionable mineral wealth of Fokien. Foreigners, too, are interesting themselves in mines, especially of coal, of which a good description of anthracite is to be found in the interior; while not far from Foochow deposits of coal of as yet doubtful quality are said to exist. It is also stated that there is clay of good brick-making quality not far from Foochow, and, with the cheapness of coolie labour, it will no doubt be utilized before long. Foochow granite, of which the quantity is practically unlimited, is occupying the attention of some enterprising minds, and building stone of a rough quality is abundant. The vast number of camphor trees in this province are rarely cut for camphor production, the timber being at present put to many other uses, boats even being built of it.

LABOUR MARKET.

UNITED KINGDOM.

Employment in the Coal Mining Industry in 1901.—Particulars have been issued by the Home Office regarding the production of coal and the number of persons employed in the principal colliery districts of the United Kingdom. It appears that last year the output of coal was 219,037,240 tons, as against 225,170,163 tons in 1900. The number of persons employed in and about mines under the Coal Mines Regulation Act, was 806,735 last year and 780,052 in 1900. It is interesting to note that during the past five years the output has increased 12.1 per cent. and the number of persons employed 16.5 per cent. The following table shows the numbers employed in each inspection district, comparative figures being given for 1900:—

District.	Number of Workpeople employed in Mines under the Coal Mines Regulation Act, in	
	1900.	1901.
Northumberland	39,728	41,145
Durham	112,835	113,934
Yorkshire	107,901	111,810
Lancashire and Cheshire	87,976	92,791
Derbyshire	46,788	49,913
Notts. and Leicester	34,108	35,322
Staffordshire	47,788	49,475
South Wales and Monmouth	147,652	150,412
West Scotland	73,400	75,732
Fife	16,339	17,420
Other Districts	65,537	68,781
United Kingdom	780,052	806,735

The considerable change which took place in the wages of coal-hewers is shown in the following table, which gives the percentage above "standards" at the end of the years 1900 and 1901 in the principal districts:—

Principal Districts.	Percentage above "standards" at end of		Increase (+) or Decrease (−) on "standards" compared with	
	1900.	1901.	A year ago.	Five years ago.
Northumberland	61.25	31.00	−30.25	+27.25
Durham	65.00	40.00	−25.00	+25.00
Yorkshire, Lancashire and Midlands	50.00	60.00	+10.00	+30.00
South Wales and Mon.	73.75	66.25	−7.50	+56.25
West Scotland	100.00	50.00	−50.00	+37.50
East Scotland	97.50	47.50	−50.00	+47.50

It may be added that the average value of coal at the pit's mouth rose from 5s. 10d. per ton in 1896 to 10s. 9d. in 1900. The corresponding average for 1901 is not yet available, but in Northumberland the mean of the ascertained quarterly averages fell from 10s. 3d. in 1900 to 8s. 9d. in 1901.

COLONIES.

The monthly report, compiled by the EMIGRANTS' INFORMATION OFFICE, states as follows:—**Canada.**—The report of the Dominion Labour Bureau for February states: "Except in those trades in which temporary cessation of employment is expected because of the nature of the season, industry and trade are active and few hands are idle." "In manufacturing and mining, work has for the most part been plentiful and steady throughout the month, and the condition of labour in most individual trades may be described as good." Persons emigrating to Canada this year should start in the spring. The principal demand is for competent farm labourers and female servants.

Australasia (New South Wales).—The building trade is not so brisk as it was, and less wages are being accepted. The engineering trade continues good, with full rates of pay. The strike among the tailors has been settled, and the minimum wage has been fixed at 17s. 6d. to 22s. 6d. a week. The wharf labourers are agitating for a rise in their wages to 1s. 3d. instead of 1s. an hour. Country districts are suffering much from the severe drought, and in some parts it is impossible to obtain employment owing to want of water and of feed for cattle. The coal trade continues busy, but silver-mining at Broken Hill is very slack, and many hands are out of work. The labouring classes generally are complaining of the increased cost of living, owing to the new tariff. (**Victoria.**)—There is a good demand for farm labourers, and especially for men able to milk, but employment is not always regular. The difficulty of getting good milkers has been one of the principal causes of the recent reduction in the output of butter, and is seriously hampering the dairying industry. There is no special demand for mechanics in Melbourne or other towns. (**South Australia.**)—Considerable numbers of mechanics and labourers, more especially those in the engineering trades, have been out of work at Gawler. Copper-mining has been very slack lately, owing to low prices, and many hands have been thrown out of employment at the Moonta mines and by the closing down of the Port Augusta smelters. (**Queensland.**)—According to the report of the Government Labour Bureau for the quarter ending December 31st, 1901, the only demand in the north was at Townsville, Charters Towers, and neighbouring places for female servants, general labourers, plantation labourers, and a few farm labourers and mechanics; in the central districts the only demand was for a few general labourers; in the south there was a large demand for farm labourers and general labourers, and some demand for plantation labourers. Miners were not in demand in any part of Queensland. (**Western Australia.**)—Reports received at the Government Labour Bureau in Perth at the end of last year show that there was a good demand for

men at Perth, especially for those in the building trades; that there was no demand at Fremantle, Geraldton, Collie, or Busselton; that there were many unemployed at Coolgardie, Kalgoorlie, Kanowna, and neighbouring goldfields; that at Northam, there was a very good demand for mechanics and unskilled labourers; and that in many agricultural districts in the south-west there was always a good demand for competent farm labourers, able to milk, work machinery, and take care of horses; female servants were wanted in nearly all districts. (New Zealand).—The clothing trade has been very busy at Auckland, Napier, Wanganui, Palmerston North, New Plymouth, Westport, Hokitika, Christchurch, Invercargill and elsewhere. The building trades have been busy generally, especially at Auckland, Gisborne, Napier, New Plymouth, Westport, Christchurch and Invercargill; but at Dunedin many men are out of work. The engineering trade is fairly well employed, especially at Westport and Timaru, and for blacksmiths and boilermakers at Auckland, but at Dunedin many are unemployed. Flax and saw mills have been busy in several places. There has been plenty of work for unskilled labour at shearing and harvesting.

South Africa (Cape Colony).—No one is now allowed to land in South Africa without a permit. This must be applied for at the Permit Office, 47, Victoria-street, London, S.W. The applicant must possess £100, or prove that he is in a position to maintain himself in South Africa. Applicants living within fifty miles of London must apply in person. These permits are no guarantee that the holders will be allowed to proceed inland. The Permit Office does not include persons wishing to go out to farm, without any definite farm in prospect, amongst those having knowledge of a trade or profession. There is a good demand for skilled mechanics in many places. (Natal).—With reference to the demand for mechanics in Natal, which was mentioned last month, the Agent-General has already received applications for passages from a far larger number of carpenters, bricklayers, plasterers, masons, and painters than he has authority to send to the colony. There have been disputes in the building trade at Pietermaritzburg on the question of wages. These have been settled by raising the wages of carpenters and joiners to 15s. a day, instead of 14s. Carpenters and coachbuilders in the railway workshops are agitating for increased pay, partly on account of the increased cost of living. There is still a large demand for labour in the colony, especially in the building trades, but emigrants must remember that they must pay their own passages, that the cost of living in Natal is now high, and that they will not be allowed to land unless they first obtain a permit from the Permit Office, 47, Victoria-street, S.W. (Orange River Colony and Transvaal).—Although the output of gold in the Transvaal is increasing, only refugees, Government employees, and persons engaged in a service of a public nature will be permitted to proceed to the Transvaal. Candidates for the South African Constabulary should apply to The Recruiting Officer, S.A.C. Recruiting Office, King's-court, Broadway, Westminster, S.W.; they must be good riders, good shots, single, strictly sober, and from 20 to 35 years of age; they will be given free passages to South Africa. Farriers also are wanted for this Force.

EMIGRATION AND IMMIGRATION.

**** The Imperial Institute acts in concert with the Emigrants' Information Office (which is under the direction of the Colonial Office), of 31, Broadway, Westminster, S.W.; and also with the British Women's Emigration Association, now temporarily carrying on its work in rooms at the Institute. The Handbooks and Quarterly Circulars issued by the Emigrants' Information Office may be obtained at the Commercial Intelligence Office. Special information and practical advice respecting Canada and Cape Colony will also be furnished by the Curators of these Sections.**

UNITED KINGDOM.

Alien Immigration (Royal Commission).—It appears from the *Gazette* that the Royal Commission on Alien Immigration is to enquire into and report upon:—

(1) The character and extent of the evils which are attributed to the unrestricted immigration of aliens, especially in the metropolis.

(2) The measures which have been adopted for the restriction and control of alien immigration in foreign countries and in British colonies;

And to advise what remedial or precautionary measures it is desirable to adopt in this country, having regard to the above matters and to the absence of any statutory power to exclude or expel any individual alien or class of aliens from its borders.

The Commissioners are Lord James of Hereford, Lord Rothschild, the Hon. Alfred Lyttelton, K.C., Sir Kenelm Edward Digby, K.C.B., Under Secretary for the Home Department, Major W. E. Evans-Gordon, M.P. for Stepney, Mr. Henry Norman, M.P., and Mr. William Vallance, clerk to the Guardians of Whitechapel. The Commission is invested with the usual powers to examine witnesses and call for documents.

British Women's Emigration Association.—The hon. secretary of the British Women's Emigration Association reports 497 applications in the month ended March 21. An alteration has been made in the dates of the Protected Parties to Canada for this season, as s.s. *Vancouver* has been transferred from the Atlantic to the Mediterranean service. After the special parties in s.s. *Dominion* on March 27 and s.s. *Colonial* on April 16, the monthly parties with the matron will be sent in s.s. *Dominion* on May 1, June 5, July 17, August 21, September 25, October 30.

Some young men have been advised to join the personally conducted parties to the North-Western Territories, planned by the Manitoba Government, for April 3, 15 and 22, May 1 and 13.

The fifth annual report of the Girls' Home of Welcome at Winnipeg has just come to hand. During the season 676 inmates passed through the Home. A party for Australia will sail under especially good escort in s.s. *Austral* at the 17 guinea rate, deck cabin. The next group for the Cape will leave by s.s. *Galatea*, April 19.

Progress is being made in the way of the reception of young women in Rhodesia by the provision of a hostel at Salisbury, where they can lodge on their arrival until suited with employment. A hostel is very much needed at Durban, and the South African Committee of the British Women's Emigration Association is anxious to help the local committee to open one there.

A well-attended meeting of the South African General Committee and their friends was held at 20, Arlington-street, by the kind permission of Lord Salisbury, on March 19. The Lady Knightley of Fawsley, chairwoman of the South African Expansion Committee, in her opening words, explained that the committee was the outcome of Mr. Chamberlain's speech at the annual meeting of the British Women's Emigration Association a year ago. It had worked hard during the ten months of its existence, and had formed sub-committees for each separate territory in South Africa, to obtain information, and keep in touch with leading persons in each colony.

Mrs. Fawcett said she had returned from South Africa strongly impressed with the importance of sending out British women.

Mr. Asquith, M.P., spoke of ignorance having been one of the chief causes of the difficulties we had had to contend with, and no greater boon could be conferred than to send out an increasing supply of well-qualified teachers.

Mr. Evelyn Cecil, M.P., one of the treasurers of the Special South African Fund, gave some statistics of the work done since the Committee was formed in May last, and mentioned that a donation of £500 had recently been received from Messrs. Rothschilds.

It was announced that the Annual Meeting of the British Women's Emigration Association would take place on Thursday April 24, at 4 p.m., Lord Selborne in the chair. The annual report to be presented on that occasion gives the following details:—The number of applications in the year, 3,851; the number of persons who emigrated through the Association during 1901 was 458; these were distributed as follows:—To Canada, 141; South Africa, 196; Australia, 85; New Zealand, 13; United States of America, 5 (the balance, 18, is children included in families). Sixty-five cases had help from the Loan Fund; eighteen loans were repaid in full during the year, the others are being repaid.

The scheme for opening a "British Women's Hostel" in London is progressing satisfactorily. Negotiations are proceeding for renting a good house within easy reach of Euston and the other principal railway stations. £200 has already been promised towards the Guarantee Fund, and donations for initial expenses amount so far to £93. Furnishing is likely to cost £300, and assistance may be given either in the form of gifts now, or promises of subscriptions, or help towards the Guarantee Fund. Contributions will be received and acknowledged by Susan, Countess of Malmesbury, 113, Queen's-gate, London, S.W., or may be sent to the hon. sec., British Women's Emigration Office, Imperial Institute.

Emigration from Ireland.—According to the emigration statistics of Ireland the emigration rate for last year was nine per 1,000, a slight decrease as compared with the previous year. Of the total—39,870 persons—18,343 were males and 21,527 females, as compared with a total of 47,107 in 1900.

Of the 18,343 males who emigrated, 1,806, or 9.8 per cent., were returned as married men or widowers; and of the 21,527 females enumerated, 2,958, or 13.7 per cent., were described as married or widowed. Of the 16,927 persons between the ages of twenty and twenty-five years, 245 only were married—44 males and 201 females.

Of the 39,613 natives of Ireland who emigrated in 1901, 33,349, or 84.2 per cent., went to the colonies or to foreign countries; and 6,264, or 15.8 per cent., to Great Britain. The United States of America absorbed 31,942, or 80.6 per cent., of the number of these emigrants in 1901, compared with an average of 32,453, or 85.8 per cent., for the four preceding years.

CUSTOMS TARIFFS.

UNITED KINGDOM.

Drawback on Export of Castor and Icing Sugar.—According to a General Order (No. 12 of 1902) recently issued by the Commissioners of H.M. Customs for the guidance of their officers, castor and icing sugar made in the United Kingdom from duty-paid foreign refined sugar may be exported on drawback, as well as that made from home refined sugar, subject to compliance with the regulations as to shipment laid down by General Order No. 65 of 1901. Copies of both the 1901 and present Orders may be seen by those interested at the Commercial Intelligence Branch of the Board of Trade, 50, Parliament-street, S.W., any day between the hours of 10 a.m. and 5 p.m.

COLONIES.

Australian Commonwealth.—The *Commonwealth of Australia Gazette*, dated 24th January, 1902, contains a Customs By-law, issued by the Department of Trade of Customs on the 23rd January last, notifying that the following machine tools used in the undermentioned industries are admitted into the Commonwealth free of duty:—

MACHINE TOOLS.

Bookbinding.

Backing, bench presses, bevelling, binding, blocking, book-rolling, book-rounding, case-rolling, case-cleaning, case-making, cutting, eyeletting, embossing, finishing press and stand, folding, glueing, indexing, laying presses, nipping presses, numbering, paging, paring, perforating, punching, ruling, scoring, stand presses, stapling, trimming, wire-stitching machines.

Bootmaking.

Accessories to stitching machines being Gem insole, insole trimming, stitch separating, turn moulding, welt beating, button fastening, channel openers, counter moulders, hooking, pattern cutting and grading, pegging, power hammer, pricker (four-stitch), rand compressing, rand splitting, rand turning, sole rounding, standard screwing, staple fasteners, strap (printing and covering), treeing, tying (shoe), upper blocking and cleaning, vamp beading, folding and marking.

Brushmaking.

Boring, cutting, filling, flue or bottle brush machine, shaping, trimming.

Glassmaking and Working.

Patent presses, roughing mills, sandblasting.

Hatmaking.

Hydraulic blocking press for making straw hats.

Indiarubber Working.

Hose machines, steel stamps, steel tire mandrills, spreading thread drums, washer cutting.

Metal Working.

Arbor or mandrel presses, cutter making, Machine tools for electrotyping, stereotyping, and photo engraving, viz., backing presses, bevelling, casting moulds, curved cutting-off cylinder, curved finishing cylinder, curving for electroplate, electrotyping, hydraulic moulding presses, matrix rolling, plate thinning, shaving, squaring, trimming, facing, flanging, horseshoe, mitring, nail making, measuring machines, profiling, riveting, rivet making, straightening, type-casting and finishing machines, washer making, welding, wire netting.

Paper Finishing, Cutting, and Folding.

Bending and creasing—cutting, viz., card, guillotine, label, lever, millboard, rotary cutting and grooving, rotary cutting and scoring—damping, envelope making, glazing and hot rolling, labelling, machines for coating and finishing, paper bag and paper box making, varnishing paper, wrapping.

Stone Working.

Litho stone grinding.

Tile, Pipe, and Brick Making.

Blungers, filter presses, grinding mill for enamels, colours, glazes, and flint, magnetiser, moulding machines, press stamps, sifters, still, spur, and thimble presses.

Bermuda.—CUSTOMS TARIFF.—The Bermuda Supply and Appropriation Act, 1901-2 (No. 2 of 1901), providing for the imposition of duties on articles imported into the colony during the year ended 30th June, 1902.

The present Act re-imposes all duties previously in force except that certain articles which have hitherto been liable under the "unenumerated" rate to a duty of 5 per cent. *ad val.*, are now separately distinguished in the Tariff, and are liable to duty as follows:—

Articles.	Import Duty Leviable.
Eggs	3d. per dozen.
Poultry, dead	10 per cent. <i>ad valorem</i> .
Bananas, from 1st December to 1st June	Free.
Articles, the property of any foreign or British Colonial Government imported into these islands for use at or in connection with any establishment or institution in these islands maintained by such Government, solely for scientific purposes, on proof to the satisfaction of the Receiver-General that such articles have been so imported	"

Canada.—TARIFF AMENDMENTS, BY ORDERS IN COUNCIL, DATED 12TH AND 13TH FEBRUARY, 1902.—The *Canada Gazette* of the 22nd February last contains certain Orders in Council, notifying that the following articles may, in pursuance of the provisions of the Customs Act, be imported into Canada free of duty:—

1. Silver tubing, when imported by manufacturers of silverware to be used in their own factories in the manufacture of silverware.

2. Steel castings in the rough for the manufacture of scissors and hand shears, when imported by manufacturers of scissors and hand shears to be used in making such articles in their own factories.

3. Materials which enter into the construction and form part of cream separators, when imported by manufacturers of cream separators to be used in their own factories for the manufacture of such articles.

4. Yarns of jute, flax or hemp, for the manufacture of towels, when imported by the manufacturers of jute, linen or union towels, to be used in their own factories for the manufacture of such articles.

5. Steel, for the manufacture of cutlery, when imported by manufacturers of cutlery to be used in their own factories for the manufacture of such articles.

6. Hemp bleaching compound, when imported by manufacturers of rope to be used in their own factories for the manufacture of rope.

REDUCTION OF DUTY ON PRINTING PAPER.—The same *Gazette* contains an Order in Council, dated 11th February, 1902, reducing, under the provisions of sub-section 3 of section 18 of "The Customs Tariff, 1897," the Customs import duty on news printing paper in sheets and rolls, including all printing paper valued at not more than 2½ cents per lb., from 25 per cent. *ad val.* to 15 per cent. *ad val.*

[NOTE.—If the "printing paper" so imported enjoys the benefits of the British Preferential Tariff Act, a further reduction of one-third of the duty is allowed.]

New Zealand.—EXPORT DUTY ON TIMBER.—The "Timber Export Act, 1901" (No. 63 of 1901), dated 8th November, 1901, empowers the Governor to levy, by Order-in-Council, a duty on various kinds of timber exported from New Zealand, as follows:—

	Export Duty.
Logs, round	s. d.
Logs, square with axe or saw	3 0
Half-logs	per 100 superficial feet.
Hitches of any particular kind, or pieces of such size as the Governor by Order-in-Council from time to time determines	"

Provision is also made in the Act for the master or agent of every ship in which it is intended to ship for export timber liable to duty, to give not less than 24 hours' notice to the Collector or other proper officer of Customs of such intention, and in such form as the Commissioner may direct by regulation.

FLAX TO BE GRADED BEFORE EXPORTATION.—The "Flax Grading Act and Export Act, 1901," provides that:—"No flax shall be shipped or placed on board any ship for exportation to any place beyond New Zealand unless it has been inspected by an officer duly authorised in that behalf, and graded by him according to regulations made by the Governor under this Act."

St. Christopher and Nevis.—Ordinance (No. 16 of 1901), assented to by the Administrator on the 17th December, 1901, provides that the following Ordinances shall be continued in force until the 31st December, 1902:—

1. *The Additional Customs Tariff Ordinance, 1896* (No. 5 of 1896)* imposing an additional import duty of 1s. 6d. per barrel on wheat flour, 20 per cent. additional on the present duties on alcoholic liquors, and 10 per cent. additional on the present duties on all other articles subject to duty.

2. *The Export Duty Ordinance of 1898* (No. 1 of 1898), imposing export duties on sugar and rum, as follows:—

	s. d.
Sugar, per hogshead, not above 42 inches truss	4 8
" " tierce	3 2
" " barrel	0 6½
" in other packages	per ton 4 8
Rum, per 100 gallons	3 6

* It was provided by Ordinances Nos. 5 of 1898 and 6 of 1900, that the additional duties imposed by Ordinance No. 5 of 1896 should not apply to petroleum and its products, ale, beer, porter, stout, perry, cider, brandy, whisky, tea, leaf tobacco (if imported in packages containing not less than 500 lb.), manufactured tobacco and snuff.

EXCISE DUTY.—A copy of an Ordinance (No. 15 of 1901) has also been received, continuing until the 31st December, 1902, the "Rum Duty Ordinance, 1896," by which an additional duty was imposed of 20 per cent. on the duty of 3s. per proof gallon leviable upon rum manufactured in the Presidency.

St. Lucia.—FREE IMPORTATION OF CERTAIN ARTICLES.—An Order in Council, dated 27th December, 1901, notifies that the Governor has, with the approval of the Legislative Council, added the following articles to the table of exemptions from import duty in the second schedule to the Customs Tariff Ordinance, No. 12 of 1895:—

1. Alcohol (pure), chemicals, materials and apparatus imported exclusively for medical or other scientific investigations, upon a statutory declaration being made to the satisfaction of the treasurer that they have been so imported.

2. Blood stock, imported for breeding purposes or for improving the breed of animals in the colony, upon a statutory declaration being made to the satisfaction of the Governor in Council as to the qualities of such stock.

Trinidad and Tobago.—AMENDED IMPORT DUTIES.—A copy of a resolution passed by the Legislative Council on the 3rd February amends the rates of duty imposed on certain

articles imported into the colony under the Customs Tariff Ordinance, No. 18 of 1895, as follows:—

	Rate Import Duty. s. d.
Bread of all kinds, per barrel not exceeding 60 lb.	1 0
Vermicelli (including macaroni), per 100 lb.	2 0
Candles, per 100 lb.	2 2

DRAWBACKS.—Section 4 of the above-mentioned Ordinance is amended by providing for a drawback of duties upon exportation of the above articles, and provision is also made for a drawback of duties on the exportation of the following articles manufactured in the colony, if the Collector of Customs is satisfied that they have been made from imported materials:—

	s. d.
Hard bread or crackers, per barrel of not less than 60 lb.	1 0
Vermicelli (including macaroni), per 100 lb.	2 0
Candles, per 100 lb.	2 2

INDIA.

Countervailing Duty on Sugar from Holland.—Customs Circular (No. 5 of 1902), issued by the Finance and Commerce Department of the Government of India on 7th February last, revises the rate of *additional* duty on bounty-fed sugar imported into India from Holland, with effect from 1st March, 1902, as follows:—

Kinds of Sugar.	Additional Duties Levied.	
	Old Rate.	New Rate.
	R. a. p.	R. a. p.
Raw sugar produced in Holland from beet-roots . . . per cwt.	0 15 3	0 14 0
Sugar refined from beet-root sugar produced in Holland . . . per cwt.	1 1 5	0 15 11
Sugar refined from imported raw sugar per cwt.	0 2 3(a)	0 1 11(a)

(a) In addition to countervailing duty, if any, on the raw sugar.

FOREIGN COUNTRIES.

France.—IMPORT DUTIES ON "COLONIAL PRODUCE."—With reference to the French import duties on "colonial produce," a Law, dated the 22nd February, 1902, has been published in the *Journal Officiel*, of which the following is a translation:—

Article 1.—The Government is authorised to accord provisionally, by Decree, the application of the Minimum Tariff for "colonial produce" to imports from:—

(i.) China, Corea, Siam, Abyssinia, Liberia, Hong Kong, the Straits Settlements, and the Federated Malay States, so long as French merchandise enjoys equivalent advantages and most-favoured-nation treatment in these States or territories; and (ii.) For the period of one year, commencing on the 24th February, 1902, to imports from the United States of America, Porto Rico, Guatemala, Nicaragua, Honduras, British India, Ceylon, Mauritius, Seychelles, Jamaica, the Dutch East Indies, German possessions in Africa, and the Spanish possessions of Fernando Po, Annobon, Corisco and Elcbe, and on the Western Coast of Africa.

Article 2.—"Colonial products" admitted into Customs warehouses as being the produce of a country enjoying the Minimum Tariff at the time of entry into a warehouse shall benefit by the application of that Tariff on their removal, even when the country of production has in the interval become subject to the operation of the General Tariff.

Russia.—ARTICLES WHICH MAY BE DECLARED BY NUMBER IN INSPECTION DOCUMENTS.—An Annex to the new Russian Customs Regulations, contains a list of articles which, while subject to duty according to weight, may be declared by number in the "inspection documents" referred to in those regulations.

The following are the articles named in this list:—

Tariff No.	Articles.
58 (1) b	Wood, of common kinds, in blocks, in beams, hewn or sawn (exceeding 2 in. in thickness).
58 (1) c	Wood in planks and scantlings (exceeding 1 in., and not exceeding 2 in. in thickness), not planed.
58 (2)	Wood, of superior kinds, in scantlings, billets, and boards.
59 (1)	Wooden wares, having carpenters' finish.
59 (2)	Barrels.
61	Furniture, of all kinds (except detached parts), whether upholstered or not.
66 (3)	Stone slabs, scantlings, grind and polishing stones of natural grindingstone, whether worked or unfinished.
66 (4)	Stone slabs, sawn or split, without further finish; slabs cut in squares or rounds; stones with sawn unfinished surfaces; blocks of a thickness exceeding 5 vershoks (8½ in.).
66 (5)	Similar slabs of a thickness not exceeding 5 vershoks (8½ in.).
66 (6)	Millstones in the form of grey stones or of grindstone.
72 (1)	Common bricks.
72 (2)	Fire bricks; roofing tiles without sculpture or ornamentation; slabs of fire clay; stock bricks.
73	Earthen drainage or water pipes.
74 (1)	Stove tiles and ornaments; glazed bricks and tiles; clay slabs for paving or walls, of uniform colour.
159	Firearms (not including accessories for firearms).
167	Sewing machines, complete, put together.
172 (4)	Musical instruments of all kinds (not including appurtenances for musical instruments).
209 (7)	Ladies' hats and other head-dresses of all kinds, trimmed.
210 (3)	Leather and lacquered hats.

* A translation of these regulations has been published as No. 569 of "Miscellaneous Series" of papers issued by the Foreign Office.

Spain.—PAYMENT OF IMPORT DUTIES ON CERTAIN ARTICLES IN GOLD.—The *Gaceta de Madrid* for the 23rd February contains the text of a new Spanish Law, which received the royal assent and was to come into operation on the 1st ult., requiring the payment in gold of Customs' duties upon certain

articles upon their importation into Spain. The following are the chief provisions of the Law as now enacted:—

Article 1.—All the articles of exportation and the duties on importation on the merchandise comprised in the following sections of the Tariff shall be paid in gold:—

Tariff No.	Articles.*
6	Coal and coke.
8-10	Petroleum and mineral oils.
11	Oleonephthas, mineral lubricating oils, vaselines, and mixtures of these products with animal or vegetable oils or greases.
12	Benzine, gasoline, and other similar products.
306	Coaches and berlins with four seats, and light carriages with two "tableros" and boxes, with or without hoods; new, used, or repaired.
307	Berlins with two seats, with or without folding seats; omnibuses with more than 15 seats, and diligences; new, used, or repaired.
308	Other two or four-wheeled carriages, without "tableros," with or without hoods, without regard to number of seats; omnibuses up to 15 seats, and carriages not specified in the preceding classes; new, used, or repaired.
316	Steel or iron or composite vessels, of any tonnage.
324	Cod and stockfish.
325	Fish powder.
332	Wheat.
333	Wheat flour.
336	Cereals not separately tariffed.
342-3	Cocoa in the bean, not roasted, and cocoa husks, of any origin.
344	Cocoa, roasted, ground, or in paste; also cocoa butter.
345-6	Coffee, in the bean, not roasted, of any origin.
347	Coffee, roasted, ground; chicory, roasted or not, and other similar products.
348	Cinnamon of all kinds, and imitations thereof.
349	Pepper, cloves, and other spices, and imitations thereof.
350	Tea, and imitations thereof, and yerba maté.
355-9	Wines of all kinds, in barrels or in bottles.

* Articles which were not named in the Bill as originally introduced into the Cortes are printed in *italic* type.

Article 2.—A reduction shall be allowed in payments of the above-mentioned duties corresponding to the average rate of exchange on foreign countries. By "average rate of exchange" is meant the premium in Madrid upon bills at sight on Paris, according to the "Bulletin of the Madrid Bourse," in the period preceding that in which payment of the import or export duties is effected. The Minister of Finance shall fix, on the 15th and on the last day of each month, the said average rate of exchange, and the reduction to be made on payments of duties during the succeeding period; these rates of exchange to be published in the *Gaceta de Madrid*.

Article 3.—In the payment of duties in gold the following are to be admitted at their full face value:—

Gold coins of Spanish currency.

Gold coins of the countries forming the Latin Union.

Bank notes of the Bank of France.

Bills of exchange or cheques on Paris, London, Brussels or Berlin, provided they are made payable in francs, pounds sterling, francs, or marks respectively, and are duly guaranteed.

Article 4.—In the payment of duties in gold the fractional sums of less than 10 pesetas may be paid in Spanish currency, which will be taken at its full nominal value.

Article 5.—Payments paid, or to be paid, in virtue of the Royal Decree of 30th November last are to be considered as definite.

Regulations under the above Law.—According to a Royal Order containing regulations for the carrying out of the above Law, which appears in the same issue of the *Gaceta de Madrid*, the rate of reduction applicable to the payment of duties upon goods imported into Spain will be that in force at the date of the shipment of the goods for Spain.

The complete text (in Spanish) of the Law, and of the Royal Orders containing regulations applying its provisions, may be seen by those interested at the Commercial Intelligence Branch of the Board of Trade, 50, Parliament-street, S.W., any day between the hours of 10 a.m. and 5 p.m.

TRANSPORT AND FREIGHTS.

The Freight Market.—Outward market continues weak at last rates, with the exception of one or two directions, where charterers have had to pay up to secure tonnage for a market which is absolutely lifeless homewards. Last fixtures have been on basis of 6s. Genoa, 4s. 9d. Malta, 7s. Adriatic, 5s. 9d. Constantinople, 5s. 9d. Port Said, 6s. 9d. Las Palmas, 13s. Buenos Ayres or Rio. American markets continue weak, with a downward tendency. Australia quiet, with less demand. Newcastle-Manila paid 12s. There has been some time chartering at 6s. foreign, 7s. to 7s. 6d. coasting. Black Sea weaker, with very little cargo available. Eastern markets have relapsed and current rates are on the basis of 13s. 6d. Bombay, 22s. 6d. Calcutta, and 22s. 6d. Rangoon. Mediterranean markets continue extremely dull. United States done at 22s. 6d. from Sicily and 10s. from Spanish ore ports. River Plate has collapsed, owing to the excessive quantity of tonnage available.—WEDDELL, TURNER & CO., March 21st, 1902.

UNITED KINGDOM.

Bristol.—NEW AVONMOUTH DOCKS.—On Wednesday, March 5, the Prince and Princess of Wales cut the first sod of the new dock, which is to be constructed at Avonmouth at a cost of about a million and three-quarters sterling. Mr. Howell Davies, in asking the Prince's acceptance of a silver model of the steam "navy" with which the first sod was to be cut, said that the undertaking included a new dock of 30 acres, capable of expansion hereafter, and a graving dock 850 feet long. The approach would be by a lock 850 feet in length and 85 feet in breadth, with a depth on the sills of 36 feet at high water of ordinary neap tides. The dock wharves would be equipped with the most efficient type of sheds, cranes and elevators, and would be connected by sidings with the Great Western and Midland Railway Companies' systems. The terminal and siding arrangements would be of the most modern character, for dealing rapidly and economically with the cargoes of vessels up to 20,000 tons capacity. He maintained that Avonmouth, for the Atlantic passenger traffic, had advantages over even such favoured ports as Liverpool and Southampton, in that coal could be obtained at lower cost and because of its central position in the country. The Prince of Wales was then conducted to

the steam navy, and he set the machinery in motion by means of a lever. The Prince and Princess afterwards visited the *Port Royal*, which had just arrived from Jamaica with bananas and other fruit.

COLONIES.

Cyprus.—ABOLITION OF SHIPPING DUES.—With reference to recent legislation as to shipping dues in Cyprus, attention is called to the fact that, except in the case of sailing vessels which choose to compound by a lump payment of a shilling a ton every half-year, no duty is now levied on a ship's tonnage, but charges are made on certain imports and exports. Particular attention is directed to the fact that only wharfage charges on goods landed or shipped are now levied, and that the shipping dues have been abolished.

Lagos.—RAILWAY TARIFF.—All goods, not including agricultural produce, are divided for railway transport into three classes for the purpose of fixing the rates at which they are carried. The following are the rates fixed for the three classes:—

Class I.	9d. per ton per mile.
Class II.	6d. " "
Class III.	3d. " "

A rebate of 7½ per cent. is allowed to any consignor who forwards a consignment of not less than 10 tons, and 10 per cent. for a consignment of not less than 15 tons.

FOREIGN COUNTRIES.

American Trade in the Levant.—The *Times* correspondent, at Vienna, writes, under date February 26:—One of those instructive reports on economic affairs in the Levant periodically published by the *Deutsche Zeitung*, of Vienna, appears in to-day's issue of that journal. In presence of the pending exchange of civilities between Germany and the United States, the following facts are of special interest. According to the report in question, two Hamburg shipowning firms have organised a direct steam navigation service between New York and Constantinople. The first steamer of this line will have arrived at Constantinople within the last few days. This new enterprise has been undertaken jointly by the German Levant line and the Hamburg-American line. A few years ago the Americans themselves attempted to establish a direct service between New York and Constantinople, but eventually gave it up. American merchandise destined for the Levant is forwarded almost exclusively *via* England by means of transshipment, which naturally increases the cost price. It is certain that the venture of the two Hamburg shipping firms will pay well. South Russia and Turkey import from America more especially agricultural machines, small ironware, textiles, etc. Those two countries export to America metallic ores, hides, carpets, opium, currants, etc. The amount of freight will increase in the same proportions as the demand for American goods.

The Americans have been making great efforts to gain a firm footing in the markets of the Levant, but hitherto they had met with some difficulty, not only on account of reluctance on the part of Eastern traders to comply with their commercial usages, but also owing to the absence of a direct steamer service. Now that the latter hindrance has been removed, it is expected that the Turkish markets will receive large quantities of American merchandise. But as the consumption among the native population increases very slowly, it is evident that the imports from other countries will suffer from American competition. German industry will also be affected, but on the other hand the Hamburg shipowners will be the gainers.

France.—PORT WORKS.—The following are some particulars relating to the improvements projected and in course of progress at the principal French ports, extracted from a report drawn up by M. Aimond, Deputy, on the improvement of the canals, rivers, and ports of France:—

Dunkirk.—At Dunkirk the entrance to the port is being dredged, the outer port is being enlarged, dockyards are being constructed, and the graving docks are being repaired. A building for the service of the port is also in course of construction, as well as a tidal wharf. The expenditure during 1901 was estimated at 2,500,000 francs (£100,000). The projected works, including the lengthening of wet docks Nos. 3 and 4 of the Freycinet basin, the displacement of the fortifications, and the acquisition of the land required for the future enlargement of the port, will entail an expenditure of 26,000,000 francs (£1,040,000).

Dieppe.—At Dieppe the tidal harbour is being dredged, a sum of 150,000 francs (£6,000) being credited for this work during 1901. The projected works include the improvement of the entrance to the port at a cost of 4,900,000 francs (£196,000), and various works in connection with the fishing industry to cost 920,000 francs (£36,000).

Havre.—At Havre it is proposed to construct a lock to provide communication between the Bellot dock and the new quays of the Tancarville canal, and also a railway siding. Other works projected are the lengthening of the Eure basin, the construction of quays, and the re-construction of the large quay to the north of the present outer port. These works are estimated to cost 20,000,000 francs (£800,000).

Nantes.—It is estimated that a sum of 22,000,000 francs (£880,000) will be required to open the port of Nantes to vessels having a draught of over 5'25 metres.

Bordeaux.—As regards Bordeaux, it is estimated that a sum of 13,000,000 francs (£520,000) will be required for the construction of another floating dock and of a graving dock.

Besides those enumerated above, proposals are made for improvement works at other ports, viz., Boulogne, Cette, Bayonne, etc.

Madagascar and Réunion.—Messrs. Charles Strecker Aine, of Antwerp, are establishing a regular service with first-class French steamers from Antwerp to Marseilles, Madagascar-Réunion (Diego Suarez, Majunga, Mananzary, Tamatave, St. Denis), and Point de Galle. The pioneer steamer (the *Montaigne*) leaves Antwerp on 31st March.

Roumania.—THE PORT OF CONSTANTZA.—The Braila correspondent of the *Levant Herald* says, with reference to the importance of Constantza as a grain-exporting centre, that never before has so much business been done at that port as at the present time. Grain is being shipped on an extensive scale, more particularly maize and barley, for which the demand from England and Italy is daily increasing. Improved appliances have been introduced in the new harbour, and loading operations have been greatly facilitated. The Administration of State Railways has laid new lines on the quays, so that steamers coming alongside can load direct from the waggons. In the completed portion of the new harbour there is berthing room for 15 steamers.

United States.—REDUCTION IN PORT DISINFECTANT CHARGES AT NEW ORLEANS.—H.M. Consul at New Orleans reports that at a recent meeting held at the State Board of Health, the following reduction was made in the disinfection charges at New Orleans, to take effect immediately:—

Steamers from 130 dols. to 105 dols.
Vessels from 80 dols. to 65 dols.
Barques from 60 dols. to 50 dols.

The above means nearly a 20 per cent. reduction.

SHIPPING FACILITIES AT PORTLAND (MAINE).—The British Vice-Consul at Portland (Maine), in his recent report, writes as follows:—"I again beg to draw attention to the facilities now afforded by the various steamship lines for direct shipment to Portland of all merchandise destined for Maine and adjoining States, etc. The rapidity with which merchandise can be cleared through the Custom-house, and the saving in storage and other expenses of this port, should have an important influence in obtaining 'repeat' orders."

OFFICIAL AND COMMERCIAL CONTRACTS.

UNITED KINGDOM.

Devonport.—TENDERS are invited, until the 16th inst., for the SUPPLY of MATERIALS and the EXECUTION of the following WORKS:—(a) Permanent way, road-bed, paving and bonding of 3 m. 1 f. 2'08 ch. of double TRAMWAY TRACK, and all incidental and special works. Particulars (£20) may be obtained from Mr. C. Chadwell, 20, Victoria-street, Westminster.

Hull.—SPRINGHEAD PUMPING STATION.—TENDERS are invited, until the 26th inst., for the SUPPLY and ERECTION of one set of ENGINE and PUMPS, complete, for the Suburban High Level District. Particulars (£1) may be obtained from Mr. F. J. Bancroft, Alfred Gelder-street, Hull.

London (Admiralty).—TENDERS are invited, until the 9th inst., for the SUPPLY to H.M. Dockyards of RIGA and ST. PETERSBURG HEMP. Particulars may be obtained from the Director of Navy Contracts, Admiralty, London.

Manchester.—The Waterworks Committee invite TENDERS, until the 19th inst., for the SUPPLY of two sets of additional steam PUMPING ENGINES, to deliver against a pressure of 1,120 lb. per square inch. Particulars (£1. 1s.) may be obtained from the secretary, Waterworks Offices, Town-hall, Manchester.

Medway Conservancy.—TENDERS are invited, until the 8th inst., for the EXECUTION of certain DREDGING WORKS in the River Medway. Particulars (£2. 2s.) may be obtained from the secretary to the Medway Conservancy, 42, High-street, Rochester, Kent.

Tarporey.—TENDERS are invited, until the 16th inst., for the CONSTRUCTION of about two miles of PIPE SEWERS from 15-in. to 8-in. diameter, etc. Particulars (£10) may be obtained from Mr. C. E. Bruges, 1, Victoria-street, Westminster.

Tottenham.—TENDERS and DESIGNS are invited, until the 22nd inst., for a REFUSE DESTRUCTOR PLANT. Particulars (£10) may be obtained from Mr. W. H. Prescott, Coombes Croft House, 712, High-road, Tottenham.

COLONIES.

New South Wales.—PROPOSED BRIDGE ACROSS SYDNEY HARBOUR.—A further extension of time for tendering for the above, until June 30th next, is announced. Particulars may be obtained from the Agent-General for New South Wales, 9, Victoria-street, Westminster. (Newcastle).—The Government of New South Wales offers a concession of a 99 years' lease of a suitable floating dock site at the port of Newcastle to any responsible owner or company undertaking to build, equip and maintain a floating dock capable of accommodating vessels up to 5,000 gross tons. Tenders to be addressed to the Under-Secretary for Public Works, Sydney. Further particulars of the Agent-General for New South Wales, 9, Victoria-street, Westminster. Contract closes April 7. (Sydney).—Messrs. Preece and Cardew are authorised by the Municipal Council of Sydney to invite TENDERS, until the 7th May, for the SUPPLY, DELIVERY, and ERECTION of the PLANT and MACHINERY required for the complete equipment of their proposed Electricity Supply Station, and sub-stations in connection therewith. Particulars (£5) may be obtained from Messrs. Preece and Cardew, 8, Queen Anne's-gate, Westminster.

Victoria.—TENDERS are invited, up to the 14th inst., for the SUPPLY of STEEL RAILS and FISHPLATES for the Victorian railways. Particulars can be seen at the Contractors' Room, Spencer-street, Melbourne, and at the office of the Agent-General for Victoria, 15, Victoria-street, London, S.W. A preliminary deposit of £1,000 is required in each case.

INDIA.

Calcutta.—TENDERS are invited for the SUPPLY of 10,000 STOPCOCKS, as follows: 1,428 inch, 2,856 three-quarter inch, 5,716 half-inch. To be delivered c.i.f. Calcutta. The stopcocks are to be a strong pattern, gun-metal, with loose valve, square head on spindle, and a false spindle not less than $\frac{1}{8}$ in. square on all sizes. Stops to have male ends screwed for iron pipe. A pattern of each size is to be sent with tender, and when tender is accepted subsequent deliveries must be equal to the pattern, or the stops will be rejected. All stopcocks must be tested by the makers up to 500 ft. head water. The stopcocks should be delivered in equal monthly instalments, and tenderers should state the number of each size they are prepared to deliver each month, and when the first instalment can be delivered. Address, Fred. Gainsford, secretary to the Corporation. Contract closes April 23.

East Indian Railway.—TENDERS are invited, until the 9th inst., for the SUPPLY and DELIVERY of:—(1) Mining Tubs and Wheels and Axles for Colliery Trucks; (2) Buffers, Screw Couplings, etc. Particulars (£1. 1s.) may be obtained from the Company's Offices, Nicholas-lane, London, E.C.

State Railways.—TENDERS are invited, until the 15th inst., for the SUPPLY of WORKSHOP MACHINES. Particulars may be obtained from the Director-General of Stores, India Office, Whitehall, S.W.

FOREIGN COUNTRIES.

Argentina.—TENDERS are invited by the Commissioners for the Drainage Works of the Province of Buenos Ayres, for the construction of the necessary works in connection with over 620 miles of main drainage canals, branch trenches, and accessory works in certain regions subject to inundations. Contractors experienced in such work, and desirous of tendering, may obtain further information by applying in writing to the secretary, Argentine Legation, 16, Kensington Palace-gardens, London, W. No date for placing contract is announced.

Egypt.—TENDERS are invited, until the 7th inst., for the SUPPLY of 350 metric tons of PORTLAND CEMENT; also for the SUPPLY of 10,400 CROSSING SLEEPERS. Particulars of these two contracts may be obtained from Lieut.-Colonel J. H. Western, Broadway Chambers, Westminster.—TENDERS are invited, until the 8th inst., for the WORKING of the Abou Zaabel QUARRIES. Particulars may be seen at the Office of the Commission of Public Ways, Cairo.—TENDERS are invited, until the 20th inst., for the SUPPLY of two LIFTING WINCHES for Ziftah Barrage Regulator Gates. Particulars may be obtained at the office of the Inspector-General of Irrigation, Lower Egypt.—TENDERS are invited, until the 10th inst., for the SUPPLY and ERECTION at Alexandria of a HYDRAULIC PRESS, working pressure 2 tons per square inch, and provided with treble

hydraulic pumps for hand power. Particulars may be obtained at the Secretariat of the Egyptian Direction-General of Customs.

Norway.—TENDERS are invited by the Stavanger Waterworks for the DELIVERY and ERECTION of a PUMP driven by a GAS MOTOR. Tenders, marked "Leverance og Monterings af Pumpe og Gasmotor," can be sent in until the 15th inst., to Stadsingeniørkontoret, Stavanger, where drawings and conditions may be obtained.—TENDERS are invited by the Norwegian State Railways, until the 15th inst., for the SUPPLY of various TOOLS and MATERIALS for use on the Arendal-Aamli line. Particulars may be examined at the Commercial Department of the Foreign Office.—TENDERS are also invited by the Intendant of the Norwegian Navy, until the 12th inst., for the following OILS: 20,000 kilogs. sweet oil (not more than 8 per cent. acid), 30,000 kilogs. marine oil, 2,000 kilogs. castor oil, and 3,000 kilogs. lamp oil of good qualities. Conditions may be examined at the Commercial Department of the Foreign Office. Apart from Customs duties, the Norwegian Government give a preference of 15 per cent. to native tenders.

Spain.—TENDERS are invited, until the 10th inst., for the SUPPLY of 45,900 metres of JUTE SACKING for making 18,000 flour sacks. Particulars may be obtained in the Directorate of the "Subintendencia Docks," Madrid.—TENDERS are invited for the CONSTRUCTION of BRIDGES as follows, viz.:—Until the 8th inst., for a bridge across the Jadrachón creek, on the road from Alcalá de Guadira to Huelva, in the province of Sevilla, at the upset price of 38,997'44 pesetas, or about £1,135, a provisional deposit of 390 pesetas, or about £11, being required to qualify any tender; and, until the 10th inst., for a bridge over the Chartera "rambla," on the high road from Tarancón to Teruel, in the province of Teruel, at the upset price of 33,106'30 pesetas, or about £964, a provisional deposit of 1,700 pesetas, or about £49, being required in respect of any tender. Particulars may be seen at the Ministry of Public Works, Madrid.—TENDERS are invited, until the 10th inst., for:—The metal spans for the bridge over the Rivers Guisande Abadin and Tamoga, on the high road from Rabade to Moncelos, in the province of Lugo, at the upset price of 36,743'69 pesetas, or about £1,061. A provisional deposit of 1,900 pesetas, or about £55, is required. Constructing a bridge over the River Tormes, on the high road from Villacastin to Vigo, in the province of Salamanca, at the upset price of 841,640 pesetas, or about £24,394. Provisional deposit, 42,100 pesetas, or about £1,215. Constructing a bridge over the River Jucar, on the high road from Silla to Alicante, in the province of Valencia, at the upset price of 364,826'42 pesetas, or about £10,536. Provisional deposit, 18,200 pesetas, or about £526. Particulars may be seen at the Ministry of Public Works, Madrid.—TENDERS are invited, until the 8th inst., for the SUPPLY of 4,000 SUITS of LINEN DRILL to the Directorate of Penal Establishments, Madrid. Particulars may be seen in the *Gaceta de Madrid* of the 7th March.—The Alquefe Mines and Railway Co., Ltd., invites TENDERS, until the 21st inst., for the CONSTRUCTION of a STEEL PIER or LOADING STAGE in the Mediterranean, at Almeria, Spain, with MASONRY and STEEL APPROACH and contingent works, comprising about 2,800 tons of steelwork. Particulars (£3. 3s.) may be obtained from Messrs. Formans and McCall, 160, Hope-street, Glasgow; or of Mr. C. E. Bulmer, Alquefe Mines, Guadix, Spain. Mr. Bulmer will be in Almeria from 1st to 8th inst., to show intending contractors over the site.

COMMERCIAL LAW INTELLIGENCE.

A Burglary Loss.—Before Mr. Justice Kennedy a case of some importance to traders was heard, the question under consideration being the liability of a retailer in furs in respect to goods consigned to him on sale or return. The plaintiffs were Messrs. BEVINGTON AND MORRIS, leather merchants and furriers, and the defendants, Messrs. J. R. DALE AND CO. (LIMITED), tailors and costumiers. According to the admitted facts, in September, 1901, plaintiffs delivered a quantity of furs to the defendants' shop in Sloane Street, on what was known in the trade as "memo." or "appro." goods not sold to be returned at the request of either party, and the plaintiffs to be at liberty to send at any time for any particular article they might require. A burglary was committed at the shop, and furs of the invoice value of £168 were stolen. It was agreed that there was no negligence on the part of the defendants, and the question for decision was who was to bear the loss. For the plaintiffs it was urged that it was a perfectly well-known custom of the trade that the risk was on the consignee up to the time that the goods were either sold or returned, and a decision of Lord Field was quoted, given twenty-five years ago, when the jury found that the custom had been established. A number of wholesale furriers and retailers gave evidence of the existence of the custom. For the defendants it was contended that the retailer was only the bailee of the goods, and when he was deprived of them, through no negligence on the part of himself or anyone in his employ, the owner was the person liable. The custom suggested was not, he urged, proved, and it was not supported by or based on reason or the requirements of the trade. If the plaintiffs were right, the whole of the risk was borne by Dale, and the whole of the profits taken by Bevington and Morris. Mr. Justice Kennedy held that the custom had been proved, and that persons dealing in the trade must be taken to have knowledge of it. In the absence of custom, the bailment would bring no liability on the bailee, if there was no negligence. In this case, where articles of particular value were consigned by the wholesale house to the retailers on "memo." or sale or return, the latter took a wider liability while the goods were in his possession. It seemed a very reasonable custom, for, while the wholesale dealer would find it almost impossible to insure them unless he could get a floating policy without reference to warehouse or shop, the retailer would have little difficulty in doing so. Judgment for the plaintiffs, with costs.

Authority of Servant to Sell.—An action was brought by Mr. F. W. WARMINGTON, L.C.C., against Messrs. CHICK AND SON, a firm of jobmasters, for the return or value of a landau, and damages for its detention and wrongful user. It appeared that the plaintiff, on returning from a visit to Scotland in 1901, found that his coachman, one William Holding, had absconded, and that the landau was missing. It was then discovered that Holding had sold it to the defendants for £55. The defendants declined to return it except on receipt of that sum. They now pleaded that Holding either was the plaintiff's agent for the sale, or had been so held out by the plaintiff as his agent that he was estopped from denying the fact. It appeared that in 1898 and in 1900 Holding had acted as the plaintiff's agent for the sale to the defendant of a bay mare and a horse, and it was also pleaded that the plaintiff had allowed the landau to be in Holding's possession and to be offered by him for sale. The plaintiff, in his evidence, admitted that his habit was to leave the sale of such horses as he wished from time to time to sell in the hands of his coachman, fixing the price himself. He had once sold a carriage, but in that case sold it himself, and he had never even contemplated selling this one. He had never detected dishonesty on Holding's part before he absconded. It appeared that when Holding brought the landau and offered it to the defendant for sale he offered the horse and harness too. On his request he was paid by an open cheque to

himself for £54, and £1 in cash. It was contended on behalf of the defendant that it might reasonably be assumed that a coachman who had been allowed on two occasions to sell horses for his master had authority to sell a carriage. Supposing it had been a third horse that he had tried to sell, could it be said that he was not clothed with ostensible authority to sell it? His lordship remarked that it would be a serious thing to decide that because a man was allowed to sell horses he might be safely considered authorised to sell everything connected with them. The jury, after an absence of two hours, returned a verdict for the plaintiff, assessing the damages at £55. Judgment was entered accordingly, with costs.

The Sale of Bread by Weight.—The case of COX (on behalf of, etc.) v. BLEINES, which was heard in the Lord Chief Justice's Court, was an appeal from a decision of a metropolitan police magistrate, who had dismissed an information under the London Bread Act, alleging that the respondent had sold bread otherwise than by weight. Mr. Daldy, for the appellant, said the magistrate dismissed the information on the ground that the sale was by weight, and his contention was that there was no evidence upon which he could so find. The appellant, an inspector of weights and measures, sent someone into the respondent's shop, who asked for a half-quarter loaf. Thereupon defendant's servant placed a loaf and two rolls in one of the scales, the proper weight being in the other. The bread did not carry the scale down, and the beam did not move at all. The person, however, who had been sent into the shop paid twopenny, took the bread away, and the proceedings were instituted. The magistrate said he was of opinion that it made no difference whether the bread was properly or improperly weighed. He was, he said, of opinion that the bread was actually weighed.

Mr. Justice Channell: I should say it was a sale by false weight.

There was no appearance on the other side, and the Court allowed the appeal, and sent back the case to the magistrate.

Salmon Catching.—DAVIES v. EVANS was a case stated by the magistrates of Carmarthen, raising the question whether an intention to catch salmon was necessary to support a conviction for catching salmon during the weekly close time by means of a permanently fixed net, which though not a salmon net had, in fact, caught salmon during that period.

The following facts appeared from the case stated:—On August 3, 1901, two informations were brought by the respondent, James Evans, of Abergwili, a superintendent of water bailiffs in the employ of the Carmarthen Bay Board of Conservators, against the appellant, a fisherman named William Davies, under bye-laws made by the Board under 36 and 37 Vic. c. 71, section 39, sub-sections 2 and 4. The first information charged the appellant with unlawfully fishing for salmon otherwise than by rod and line at 4.30 p.m. on Sunday, May 25, 1901, during the weekly close time. The other charged him with attempting on the same occasion to take salmon with a net of less dimensions than allowed by the bye-laws. The justices convicted the appellant and fined him 10s. and costs, with the alternative of seven days' imprisonment on each charge. The informations were, by consent, heard together, and the following facts were proved. The appellant was the owner of a net in the estuary of the Towy, permanently fixed in position. The mesh was smaller than required by the law regulating the size of mesh for salmon nets, and the net was kept up during the weekly close time fixed by the bye-laws. Large quantities of coarse fish were caught and salmon occasionally. The defendant held a salmon licence in respect of the net. No bye-law had been made under 36 and 37 Vic. c. 71, section 39, sub-section 11. On the part of the appellant it was contended that the net was not peculiarly adapted for catching salmon and that it was not fixed for that purpose, and that the licence was taken out to enable him to keep any salmon that might occasionally be caught, and did not convert it into a salmon net so as to render it subject to the bye-laws. On the part of the respondent it was contended that the fact that the net was fixed in salmon waters and caught salmon, and that the appellant had taken out a licence in respect of it, brought it within the operation of the bye-laws. The question for the opinion of the Court was whether the facts that the net had been fixed in salmon waters and had taken salmon, and that the appellant had taken out a licence in respect of it, brought it within the operation of the bye-law as to weekly close time.

The Lord Chief Justice said that they were all of opinion that the case ought to go back to the justices, with a direction that the facts stated would be sufficient to justify a conviction if the justices found intention, but the intention was to be gathered from the facts. It would be no answer for the appellant to say that he had no intention. The intention was to be gathered from his conduct. Case remitted and costs to abide the result.

BRITISH CONSULAR REPORTS.

Colombia.—The British Vice-Consul in Colombia describes, in his latest report, the condition of Colombia after more than two years of civil war. He says that national industry is crippled and all commercial intercourse with the interior checked. The carriage of merchandise on the Magdalena river, the main artery of the internal trade of the country, has become all but impossible. The Government has done all that it could to protect the large British mining interests in the Tolima district, and the managers of the important mining establishments have thus been enabled to carry on their work in spite of the condition of the country. It is many years since all the specie was driven out of the country, and an inconvertible paper currency substituted. The value of this paper declined little before the present revolution, but since then it has fallen so that 312 pesos in November, 1898, would purchase the same amount of sterling that 4,800 pesos would in November, 1901. The consequence is the dislocation of trade at the ports. Thus, there have been cases in which a merchant would sell a large quantity of goods on a Monday. As bills in the market on that day stood at 2,000 per cent., he would guard himself and liquidate at 2,300 per cent. On the Saturday following he wishes to convert his gains of the week into gold, and finds that to buy drafts he has to buy at 2,700 per cent., so that his transactions of the week result in a considerable loss. Matters have come to such a pass that merchants are beginning to refuse to sell except to such as are able to pay in gold.

The gold and silver mining industry is chiefly in British hands. Some of the most important mines are rediscovered Spanish workings, one of these yielding as much as 1,000,000 oz. of fine silver in a year. Most of the silver mines are well provided with modern mining and milling machinery. The gold is both vein and alluvial.

The emerald mines of Muzo and Coscuez, the property of the Colombian Government, have produced the finest emeralds in the world. They are at present rented to a British company. Up to the year 1875 all the emerald mines in the country were the property of the nation. After that date the Government granted the right of exploration and working to private enterprise, reserving only the right to the Muzo and Coscuez mines. Since then several companies have been formed and considerable capital expended, with very poor results. The most promising of these seems to be the Somondoco mines, worked by a British company. The department of Boyacá, from a mining point of

view, is of a totally different geological formation to the other mining departments of the Republic, no gold or silver being found save in the few rivers emptying into the Magdalena. The one great mine of production is that of Muzo, famous since the year 1555 for the production of the finest emeralds of the world, a stone, in the rough, weighing 2,330 carats having been taken from one of the many veins of this mine. These mines are the property of the Colombian Government, who leases them for periods of five years to the highest bidder at public auction, which takes place in the capital of the Republic one year previous to the expiration of the term in force. The value of the production of these mines has always been kept a secret by the lessors.

Portugal.—COMMERCIAL CONDITION.—The British Commercial Attaché at Lisbon, in his last report, states that recent statistics show that the trade of Portugal continues to make considerable progress in spite of financial depression and colonial difficulties in Africa. The volume of trade is small, for the population is small; but imports and exports steadily increase, and the general condition of the country offers favourable prospects for the future. By nature Portugal is agricultural rather than industrial, but since 1891, when the protectionist movement began, Lisbon and Oporto have become surrounded by factories in which almost all classes of goods are now manufactured. The high Customs tariff has raised prices and greatly increased the cost of living; but the growth of these factories, though making life harder for the agricultural classes, has tended to raise wages and the standard of living, so that, in spite of high duties, the demand for foreign goods has increased.

There is still much for foreigners to do in Portugal. Lisbon and Oporto are large and flourishing cities demanding all the necessities of modern life. The country is in a backward condition, and the trade in wine and cork, as well as agriculture, is capable of further development, although they have already brought in large sums of money. Mining shows signs of being established on a profitable basis, and the investment of capital in tramways and public works shows a general advance in the prosperity of the country. The wine trade has suffered of late from over-production. The manufacture of good, cheap wines has only been seriously undertaken quite recently. Up to 1886 Portuguese wines, except port and Madeira, were used only at home, in the colonies, and the French wine factories, and there was no demand in Europe. But now the production of good wines, of the nature of claret and hock, is increasing, care is taken in their manufacture, the flavour and quality are excellent, and the wines are superior in many ways to others of the same price. These carefully-made cheap wines should make their way in the United Kingdom and compensate for any decline in the port wine trade that may occur in consequence of altered tastes. At present this trade receives as much support as ever in this country. Indeed, the general trade of the United Kingdom with Portugal continues to increase more in proportion than that of any other country. Mr. Harrison urges that this old-established trade connection deserves strengthening in every way. All the natural products of Portugal—wines, agricultural produce, and minerals—are wanted in the United Kingdom, and Portugal wants British manufactures. Good quality is important and has hitherto been a characteristic of British goods, and this should be industriously maintained.

FOREIGN CONSULAR REPORTS.

Artificial Fuel in Belgium.—The principal, and in fact practically the only, artificial fuel manufactured in Belgium consists of a composition of

COAL DUST

made in the form of large bricks, either solid or perforated, and used chiefly as fuel for steam engines, locomotives, etc. Small bricks are also manufactured in the form of cubes or of parallelograms, in round or oval balls, and are used in place of anthracite coal for stoves built on the American system. The material employed for the manufacture of these bricks is coal dust which has generally been previously washed. The glutinous element used in the composition is the residue from the distillation of coal tar, which residue is produced in large quantities by the manufactories for the distillation of tar obtained from the gas and coke plants. The bricks thus manufactured contain 94 per cent. of coal. The coal dust is usually obtained from what is called hard coal in this country (not anthracite) and from coal which is said to be one-fourth soft. In 1900, 1,395,910 tons of large and small bricks and balls were manufactured. In this amount is not included the production of some minor manufactories where small balls without tar residue are made from coal one-half soft. The materials used in these small balls are held together by injecting steam into the mass while it is being moulded and pressed. About 1,000 tons of these small balls, without tar residue, were manufactured in 1900. The average price at the manufactory of the large bricks and balls made with tar residue was, in 1900, 23.56 francs per ton. The commercial movement in these composition bricks of coal is rather important in Belgium, and is increasing every year. In 1900, the exportation amounted to 604,864 tons, as compared with 525,625 tons in 1899.

PEAT AND WOOD.

There exist in the north-west and also in the south-east of Belgium some small plants for the manufacture of fuel from peat. As the peat in Belgium is of rather an ordinary quality, containing a great deal of earth, sand, and other mineral products, it is used for fuel purposes only in the district where it is produced. There is no exportation of this product. There is a small amount of artificial kindling produced, which is made from sawdust and small bits of wood held together by a glutinous substance produced from the tar of the wood. This kindling is pressed into the form of bricks, which are grooved for the purpose of readily dividing them into four parts.—*United States Consular Reports.*

Cotton Goods in Smyrna.—The United States Consul at Smyrna states that the chief obstacle in the way of developing American trade is German competition. He learns that in many instances the Germans, to gain business, dispose of large quantities of goods at absolutely cost price and give long credits. More than this, they make articles which are especially adapted to this market. Their goods have an attractive appearance, but are of inferior construction and quality. Americans seem to be unable to meet English competition in cotton prints (an article of great importance in this country). The English goods are cheaper and conform to the requirements of this market. Local merchants say that cotton prints should be about 28 inches in width, the cheaper qualities 26 to 27 inches, and the better qualities 28 to 29 inches. The designs should be devoid of figures of animals; those of men, women, horses, dogs, or birds being especially objectionable. Flowers and vines are desirable in bright, gaudy colours, especially red and yellow or blue and green.

Pharmaceutical Specialities in Turkey.—Difficulties accompanying the introduction into the interior of Turkey of foreign pharmaceutical preparations, prompt the United States

Consul at Harput to call attention to the regulations regarding this class of imports. In an Imperial Order issued some time since concerning the sanitary examination of imports into the Empire, it is stated that the entrance of pharmaceutical specialities of unknown composition, or not meeting the requirements of the French pharmacopœia, is forbidden. An exception, however, is made in the case of such specialities of these two categories as have been approved by an "official academy" (*académie officielle*), i.e., a chartered medical society. In order to secure the entrance of an article of this nature, the importer is required to secure an authorisation from the Imperial Medical College at Constantinople. The latter requires that the demand for such authorisation should be accompanied by a certificate from the "academy" indorsing the article in question, and either a sample of the article or the formula of its composition, where there is a departure from the requirements of the French pharmacopœia. All the documents in the case should be certified by an Ottoman Consul in the country of origin. In order to avoid delays and difficulties the Turkish medical officials urge strongly that great care should be taken to secure proper Ottoman consular certification for all papers submitted in connection with such importations. Further, they call attention to the requirements that all formulas should be written either in French or Turkish. Quantities and proportions should be stated with the utmost clearness. The names of constituents employed should be those used in a purely scientific nomenclature, and not those customary in trade. In general, formulas and labels should be of such a character that they can be easily understood by official examiners possessing a very limited scientific knowledge and practically no familiarity with commercial terms. It is constantly to be borne in mind that Turkish officials look with exaggerated suspicion upon anything containing poisonous or explosive constituents. The extreme difficulty of securing potassium chlorate in Turkey for such an innocent use as a throat gargle is an example in point.

CHAMBERS OF COMMERCE REPORTS.

UNITED KINGDOM.

The Association of Chambers of Commerce of the United Kingdom.—The forty-second annual meeting of this Association was held on the 4th and 5th ult., at the Hotel Métropole, London. Lord Avebury, the president, in moving that the report and financial statement be adopted, said that when he last had the honour of addressing them he brought forward some figures which seemed to him to show that we need by no means take a desponding view of British commerce. He would now give them some different, though, as it seemed to him, very striking figures. The value of our total exports and imports was in 1860 £378,000,000, in 1870 £547,000,000, in 1880 £697,000,000, in 1890 £749,000,000, in 1900 £877,000,000. No doubt, however, there were dangers to be guarded against. If English commerce and manufactures were to hold their own they must all pull together—employers and employed alike.

Though they must not attribute too much significance to small variations, it was to be regretted that during the past year our exports and imports had fallen slightly. No doubt the diminution was only £7,000,000, and, as the total was £870,000,000, the reduction was really almost infinitesimal. It was, moreover, entirely due to a reduction in the export of coal and coke; or, as there had of course been other changes, perhaps he should rather say that the reduction in coal and coke was £8,250,000, and that if it had not been for this there would really have been an increase on the year. The figures were the more remarkable if they bore in mind the great falling-off in prices. For some purposes the weight of goods would be a better criterion than the value. Mr. John Williamson, of Liverpool, had calculated out for the Chamber of Shipping the total weight of our exports and imports as having been for 1880 53,000,000 tons, for 1890 76,500,000 tons, for 1900 102,500,000 tons, so that they had practically doubled in 20 years.

Taking another test—the total tonnage, steam and sailing, entered and cleared with cargoes or ballast at ports in the United Kingdom—Sir John Glover, in a paper read before the Statistical Society, had shown that the tonnage had risen from 39,634,000 in 1850 to 208,777,000 in 1900. These figures were exclusive of the tonnage for British vessels employed by Government in connection with the South African war. Not only were the figures for 1900 enormous and the greatest on record, but they showed the largest increase of any of the past five decades with one exception.

Referring to the question of the bounties, subsidies, and other advantages given to French shipping, he pointed out that, if our shipowners received no bounties, they, at any rate, were not burdened by contributions to bolster up other trades. The French wine-growers were now agitating for bounties, urging, not unnaturally, that if they were taxed to support other trades they should themselves receive corresponding treatment. But if all trades were equally protected none would benefit. They would pay with one hand what they received with the other; or, rather, they would pay more and receive less, because they would have to support an army of officials and Custom-houses, with all the expense and loss of time of declaring values, official examinations, and all the tedious routine which was such an impediment to commerce. If, moreover, one trade were unduly favoured, industry might be diverted into directions where full benefit could not be taken of the special advantages of the country. The United States seemed disposed to embark on the same course as France. Very powerful interests and a strongly-organised lobby were behind the Bill now before Congress. It was computed that this Bill, if it became law, would involve a yearly payment of at least \$9,000,000 to American ships of various classes. Nine million dollars was a large sum, but not enough, he believed, to effect so great a revolution in commerce as was projected. Last year he hinted a doubt whether the state of German trade was altogether healthy, and subsequent events had fully justified his apprehensions. Those events had shown the effect of relying on special Government grants, and he would venture to suggest that the best thing a Government could do for commerce was to let it alone. So far as we were concerned, the efforts of foreign Governments to push some of their trades hampered and handicapped the rest. Our sheet-anchor was the favoured-nation clause. He trusted our Government would hold fast by the policy of the open door, and, in the case of North China, for instance, would urge the United States, Japan, and other countries to join us in insisting that the commerce of the world shall have fair play.

The following resolutions were carried:—

(a) "That His Majesty's Government be urged, in the interests of commerce, that before recognising the transference of territory by any Power, they should insist on the adoption of the policy of the 'open door,' and should invite the co-operation of other States who are similarly interested with this country in maintaining existing rights."

(b) "That this Chamber is of opinion that the Mandalay-Kunlon railway should be extended without delay to the frontiers of China, and that the project for the construction of a line or lines in connection therewith to Yun-nan and Sze-chuan should receive the diplomatic and financial support of His

Majesty's Government and the Government of India; or if any other way of approach by rail to the Chinese provinces named be preferred by the British and Indian Governments, this Association would ask that a similar measure of support should be given to the contractors of any suitable railway by such route."

(c) "That this meeting strongly supports the resolution carried at the Fourth Congress of Chambers of Commerce of the Empire, stating 'that this Congress urges upon His Majesty's Government the appointment by them of a Royal Commission, composed of representatives of Great Britain and her colonies and India, to consider the possibilities of increasing and strengthening the trade relations between the different portions of the Empire,' and that a deputation be appointed by this Association to wait upon the Prime Minister, the Secretary of State for the Colonies, and the President of the Board of Trade to lay the question fully before them."

(d) "That this Association greatly regrets the comparative neglect of modern languages and science in our great public schools, and that a memorial be addressed to the Lord President of the Council urging him to take such steps as may be necessary to give effect in this respect to the wise regulations and statutes made by the Royal Commission on Public Schools, which was presided over by the late Archbishop of York, and of which the present Prime Minister was himself a member."

(e) "That the present state of the law as to punishment of fraudulent bankrupts is unsatisfactory, and that the executive council be requested to consult the various Chambers in the Association with a view to a Bill being introduced into Parliament to amend the existing law."

(f) "That this Association urges upon His Majesty's Government the desirability of introducing a Bill to secure the franchise in municipal and other local elections for corporations, limited liability, and other public companies; and that the voting power be limited to one vote per corporation or company."

(g) "That the Board of Trade should be requested to grant facilities for a full enquiry into the unsatisfactory working of the present law in regard to trade marks, and to receive a deputation thereon."

(h) "That, in the interests of British trade, the compulsory use of the metric system of weights and measures has become imperative."

(i) "That this Association records its appreciation, in the interests of commercial and other beneficial legislation, of the efforts now being made for the amendment of the present system of transacting both public and private business by Parliament and in Parliamentary committees, and, in addition, recommends the desirability of (1) Bills which have passed their second reading in one session being taken up in the next session of the same Parliament at the stage which they had reached in the preceding one; (2) enquiries into private Bills being conducted locally before Commissioners appointed by Parliament in a manner similar to that prescribed by the Act of 1899 with regard to Scotch Bills, instead of before committees of the Houses of Parliament."

(k) "That, in the opinion of this Association, the best means of providing an adequate supply of efficient and well-trained seamen for the services of the mercantile marine and Royal Naval Reserve was through the instrumentality of training ships and marine schools, and that memorials should be presented asking that such ships and schools should receive Government support."

Resolutions were also adopted advocating the raising of the fare limit for motor-wagons, the adoption of the Rating of Machinery Bill as a Government measure, the extension of trustees investment powers to eligible British securities at present disallowed, the provision of underground telegraph wires between London, Liverpool, and all other important commercial centres, the improvement of the cable communication with the Continent, the simplification of the half-penny postal regulations, and the reconstruction of the three lighthouse boards on a representative basis, to include representatives of shipowners, merchants, and shipmasters.

A cordial vote of thanks was passed to Lord Avebury for presiding, and the proceedings ended.

Liverpool.—Meetings of the committee of the African Trade Section of the Chamber have been held recently, presided over by Mr. John Holt, vice-chairman, in the absence of Sir Alfred Jones.

A copy of the ordinance, as contained in the *Government Gazette of Lagos*, No. 61, 1901, was submitted to the committee. The opinion was expressed that there should be no restrictions on the disposal by a native of his labour in the best market available, except such as would tend to safeguard his interests when employed. The committee had already expressed such an opinion in the case of the Sierra Leone native labour ordinance, and a letter was accordingly sent to Mr. Chamberlain reiterating the views of the committee, and asking him to receive a deputation on the subject. Mr. Chamberlain was also asked to give further information on the subject of the ordinance. He replied that the Governor of Lagos had telegraphed that a native labour ordinance had been passed, but that the text of the ordinance had not yet been received. Under this ordinance, labourers before leaving the colony will have to obtain the sanction of their chiefs, and must be engaged before a magistrate; half wages to the end of their agreements must be paid in Lagos, and employers are required to pay a capitation tax of £1 a head. In a subsequent letter Mr. Chamberlain wrote suggesting that the question of his receiving a deputation on the subject should not be dealt with until the text of the ordinance had been received.

Representations were made to the Colonial Office as to the advisability of continuing the telegraph line in Sierra Leone, running from Freetown to Mano, on to Sherbro, as there is no telegraphic communication between Sherbro and Freetown. The Colonial Office replied that they are consulting the Governor on the subject.

A sub-committee, consisting of Messrs. Holt, Moore, Cotterell, Paterson, and Lawrence Jones, have been appointed to consider the forestry proclamation of Southern Nigeria, and the rules, orders, etc., connected therewith. The sub-committee have met, and a report has been prepared on the subject, to be submitted to the full committee.

A letter was read from the Governor of Lagos, thanking the Chamber for bringing to his notice the scheme of Colonel Lamprey for ambulance trains, and saying that, after fully examining it, he does not consider anything of the kind is required in Lagos.

Cork.—According to the *French Journal Officiel*, the production of cork in the world, estimated at 1,000 metric tons (metric ton=2,204 lb. avoirdupois), is confined to Portugal, Spain, France, Italy, and North Africa (Tunis, Algeria, and Morocco). The area of French forests, including those in North Africa, really producing cork is more than one-half of the total extent of cork forests. These forests are composed mainly of cork trees, intermixed with pines and evergreen oaks. The demand for cork increases from day to day; and it is added that France, the United Kingdom, Germany, Russia, and the United States absorb 85 per cent. of the total consumption of cork.

GENERAL INTELLIGENCE OF THE PAST MONTH.

March, 1902.

UNITED KINGDOM.

MARCH 1st: St. David's Day was celebrated. Mr. J. Bryce presided at a dinner of the Eighty and Russell Clubs.

2nd: Death of Mr. John F. Bentley, architect.

3rd: The Prince and Princess of Wales left London for Bristol. In the House of Lords the Bill for the Prevention of Cruelty to Wild Animals was withdrawn. The House of Commons passed the second reading of the London Water Bill. Death of Lady Fazalgette.

4th: In the House of Commons Mr. Brodriek announced important changes in Army administration. Dr. J. McKean (N.) was returned unopposed M.P. for Monaghan, S. The Associated Chambers of Commerce opened their annual conference at the Hotel Métropole. The Queen Victoria Memorial Fund amounted to £190,000. The Duke of Bedford was appointed a K.G., and the Marquis of Waterford a K.P. The London Hackney Show was opened at Islington. Death of Mr. Bryan Donkin.

5th: The British Empire Trade League held a conference at Westminster. The Prince and Princess of Wales visited Avonmouth, when the first turf of the Royal Edward Dock was cut. The Birmingham Spring Shorthorn Show was opened. Sir H. Campbell-Bannerman was entertained at dinner by the National Liberal Club. Small-pox continued to spread in London.

6th: The King held a levée at St. James's Palace. Deaths—Lord Malcolm of Portlough, Sir T. Lucas, and Mr. W. Johnston of Liverpool. The Duke of Argyll presided at a meeting of the Women's Liberal Association.

7th: The King and Queen, accompanied by Princess Victoria, visited Dartmouth, where the King laid the foundation-stone of the new Naval College. The Prince of Wales presided at the annual general court of the King Edward's Hospital Fund. Princess Christian opened the annual exhibition of the Royal Amateur Art Society.

8th: The Queen launched the battleship *Queen*, and the King laid the first plate of the battleship *King Edward VII.* at Devonport. Death of Dr. Lumsden Probert. Death of Admiral C. L. Hockin. 73 cases of small-pox were reported in London.

10th: The King and Queen returned to London from the West. Lord Rosebery addressed a large public meeting at Glasgow. The Lord Mayor opened the exhibition of Colonial Products at the Royal Exchange.

11th: Lord Rosebery addressed the students of Glasgow University. The Central Poor-Law Conference was opened in the Guildhall.

12th: The King held an investiture at St. James's Palace. The Prince and Princess of Wales visited Manchester. In the House of Commons the Coal Mines (Employment) Bill was defeated. Mr. John Morley addressed a Liberal meeting in Manchester. The annual meeting of the Royal National Lifeboat Institution was held; the Prince of Wales was elected President.

13th: The Prince and Princess of Wales returned to London. The Princess Louise, Duchess of Argyll, visited Liverpool, and opened the new Northern Hospital. In the House of Lords the London Water Bill passed the second reading.

14th: The first Court of the new reign was held at Buckingham Palace. Lord Rosebery presided at the annual meeting of the City Liberal Club. Death of the Rev. Dr. Gee, Canon of Windsor. The Polo Pony Show was opened at the Agricultural Hall. It was announced that the proposed visit of the King to Ireland had been abandoned for the present. In the House of Commons the London County Council General Powers and Electric Supply Bills were read a second time. Death of Sir Gen. Sir W. G. Hunter.

15th: Lord Wolseley left Southampton for Cape Town. Death of Sir Richard Temple.

16th: The Bishop of London preached a farewell sermon to the boys of Christ's Hospital.

17th: The Prince and Princess of Wales opened the annual exhibition of the Irish Industries Association. St. Patrick's Day was celebrated. The Charity Organization Society held its annual meeting.

18th: The King decided to give a dinner to the poor in London in celebration of the Coronation. In the House of Commons a vote of censure on the Government was rejected.

19th: The Prince of Wales opened the National Physical Laboratory at Bushey-park. The Institution of Naval Architects opened their spring meeting. In the House of Commons the Aged Pensioners' Bill was read a second time. An International Cookery Exhibition was opened at the Albert Hall.

20th: The Prince and Princess of Wales visited the London Hospital. In the House of Commons the Consolidated Fund (No. 1) Bill was read a third time.

21st: Lord James of Hereford presided at the annual meeting of the Liberal Union Club. Captain Nott Bower was elected Commissioner of the City of London Police in the room of Sir H. Smith, resigned. A Royal Commission was appointed, with Lord James of Hereford as Chairman, to enquire into and report on the unrestricted immigration of aliens.

22nd: The Prince and Princess of Wales visited the Children's Hospital, Gt. Ormond Street. Cambridge won the University Boat Race. The Rev. C. Smith was appointed a Canon of Windsor in the room of the late Canon Gee. An Industrial Conference was held at Bradford by the Labour Association. The first-class cruiser *Lancaster* was launched at Elswick.

24th: The Queen, accompanied by Princess Victoria, visited the Alexandra Hospital. The Prince of Wales presided at the annual meeting of the Royal Naval Fund. A Royal Commission was appointed to enquire into the physical training provided in State-aided schools in Scotland.

25th: The Prince and Princess of Wales visited Chatham, and the Princess launched the new battleship *Prince of Wales*. Mr. E. A. Brotherton (U.) was elected M.P. for Wakefield, in the room of Viscount Milton, now Earl Fitzwilliam. Death of General E. O. Leggatt.

26th: The Queen left London for Copenhagen. The Queen Victoria Memorial Fund amounted to £191,730. Mr. G. J. Frampton, A.R.A., was elected an Academician. In the House of Commons the Shops Clubs Bill was read a second time.

27th: The King left London for Cowes. Mr. J. Gavey M.L.C.E., was appointed Engineer-in-Chief of the Post Office.

28th: Death of Sir G. W. Edwards at Bristol. The King visited Osborne House. Death of Earl Temple at Cairo.

29th: The School Attendance Officers' National Association opened their annual conference. Death of Sir Sidney Shippard, formerly Resident Commissioner in Bechuanaland.

31st: The National Union of Teachers opened their annual conference at Bristol. The tenth annual conference of the Independent Labour Party was opened at Liverpool.

COLONIES.

Australia.—7th: The Federal House of Representatives continued to reduce the proposed tariff duties.—13th: The discussion of the Tariff Bill was concluded: it was decided that imports by the States Governments should be dutiable.—18th:

Mr. Deakins introduced a Bill in the Federal House providing for the establishment of a Federal High Court.—20th: The Federal Senate rejected the clauses of the Electoral Bill providing for proportional voting.—24th: Strong protests were raised in all the States against the abolition of the tea duty. **New South Wales.**—3rd: Death of Mr. Yardley, C.M.G., Secretary to the Agent General in London.—13th: The Chamber of Commerce of Sydney interviewed Mr. Barton with regard to the trade relations of the Commonwealth with the New Hebrides.—**Victoria.**—20th: It was proposed to reduce the pay of Members of the State Parliament.—31st: Death of Lieut.-General the Hon. Sir Andrew Clarke, Agent General in London.—**South Australia.**—31st: The Ministry was re-constituted, with Mr. Jenkins as Premier and Chief Secretary.—**Western Australia.**—7th: Major-General Sir H. Chermiside arrived at Fremantle.

New Zealand.—7th: Sir J. Prendergast was appointed a Director of the Bank of New Zealand, in the place of Mr. Blair, resigned.—9th: The Premier, Mr. Seddon, urged that the Australian Squadron should be strengthened.—15th: A sixth contingent of 1,000 men, making in all 6,000, was despatched for service in South Africa.—25th: The first section of the Pacific cable connecting New Zealand with Norfolk Island and Australia was completed at Doubtless Bay.

British West Africa.—6th: It was reported that the movements of the British columns against the Aros had been entirely successful.—14th: It was stated that the Aros intended to recommence fighting in November next.

Canada.—11th: It was announced that Sir Wilfrid Laurier would leave Canada for England about June 10.—17th: Mr. Fielding, the Financial Minister, presented his budget, showing a surplus of \$5,800,000.—22nd: The Dominion Cabinet decided to send a military contingent to the Coronation.—25th: The Government offered to send another contingent of 2,000 men for service in South Africa.

Cape Colony.—4th: The Parliament was prorogued till April 4.—8th: Mr. Rhodes was reported to be seriously ill.—20th: It was reported that Mr. Rhodes was recovering from his illness.—26th: Mr. Cecil Rhodes died at his residence near Cape Town in his 49th year.—27th: Princess Radziwill was committed for trial for forgery. The Boer "Government" reached Kroonstad and endeavoured to meet Mr. Steyn.

Ceylon.—17th: It was decided to found an eye hospital and an asylum for the blind as a memorial to the late Queen Victoria.

Jamaica.—2nd: Sir A. Jones arrived at Kingston.

Malta.—12th: The Members of the Legislative Council who resigned, were all re-elected unopposed: they declared themselves open to conciliation.—21st: The newly-elected members declined to consider the estimates until they received a reply from the Government respecting its policy on the language question.—26th: The Chief Secretary announced that teaching in Maltese in elementary schools would be limited to a period of one year. The estimates were passed with the exception of the education vote.

Natal.—1st: The Land Commission reported in favour of a general land tax.—8th: The Legislative Assembly adopted a motion making military service compulsory.

Newfoundland.—3rd: The population of Newfoundland and Labrador was stated to be 220,249.—12th: The *modus vivendi* Bill was passed and received the Governor's assent.

Orange River Colony.—1st: Major-General Sir C. Knox was appointed to command the Bloemfontein garrison.—14th: The Boers were driven between Frankfort and Lindley, but the main body escaped under Commandant Mentz.

Transvaal.—1st: The total Boer losses in recent operations was reported to be 819.—7th: It was stated that 1,295 stamps were at work on the Rand.—8th: Lord Kitchener reported the capture of a large quantity of Boer ammunition and stores.—8th: Lord Methuen's column, while moving to Lichtenburg, was surrounded and routed by the Boers under De la Rey. Lord Methuen was wounded and captured.—13th: Lord Kitchener reported that Lord Methuen had been released and brought to Klerksdrop.—23rd: The Boer "Government" arrived at Pretoria, under a flag of truce.—24th: Lord Kitchener reported further captures of Boers and war munitions, including three Krupp guns.

INDIA.

1st: The total number of persons in receipt of famine relief was reported to be 359,000.—8th: The number on famine relief was 369,000.—11th: The Mahsud blockade was withdrawn.—24th: The number of persons on famine relief was 392,000.—25th: Death of the Rt. Rev. F. Gell, Bishop of Madras from 1861 to 1898.—31st: Lord Curzon visited the Nizami of Haidarabad.

FOREIGN COUNTRIES.

Afghanistan.—8th: It was reported that the Ameer, anticipating trouble, had requested the Hadda Mullah to defer his visit to Cabul.

Arabia.—2nd: Fighting between the tribes was reported to have taken place in Central Arabia.—8th: Cholera broke out at Medina and Mecca.—26th: The cholera epidemic continued at Mecca, Medina, and Jiddah.

Belgium.—5th: The International Convention for the abolition of sugar bounties was signed at Brussels.

Bulgaria.—3rd: The elections resulted in the return of 97 Ministerialists and 92 members of other parties.—23rd: The Cabinet was reconstructed with M. Dimeff as Premier and Minister for Foreign Affairs, and M. Sarafoff as Finance Minister.

China.—1st: The rebellion in the Nanning district became serious.—4th: China urged the Foreign Powers to withdraw the provisional Government from Tien-tsin. 10th: Russia agreed to withdraw from Manchuria within 18 months of the signing of the proposed convention.—18th: The rebellion spread through the three provinces of Kwang-si, Kwang-tung and Yun-nan; General Ma was forced to retreat.—20th: Marshal Su's troops joined the rebels.—22nd: It was reported that a Belgian syndicate was negotiating for a concession of the Shanghai-Suchau-Nanking railway. The Kwangsi rebels captured the town of Kau-chau in Kwang-tung.

Corea.—16th: Work was begun on the Seoul-Wi-ju railway.

Cuba.—25th: It was stated that the island would be handed over to the Cuban Government on May 20, when Señor Palma will take office as President.

Denmark.—14th: The Folkething approved of the sale of the Danish West Indies to the United States.—27th: Queen Alexandra arrived at Copenhagen.

France.—3rd: M. Waldeck Rousseau continued to recover from the effects of his carriage accident.—5th: The National Miners' Congress decided that the eight hours' day should be obtained by a general strike. Prince Urusoff, the Russian Ambassador, presented an autograph letter from the Tsar to President Loubet inviting him to visit Russia.—7th: The Senate adopted the new Shipping Bounties Bill. The Chamber shelved an interpellation on the Anglo-Japanese agreement.—18th: The Chamber resolved that the next and future Chambers should last six years instead of four.—24th: A Bill was adopted by the

Chamber for a credit of 500,000 fr. to defray the expense of the Presidential journey to Russia. The Senate Committee opposed the prolongation of the legislative term from four to six years; M. Waldeck-Rousseau agreed to its abandonment.—27th: M. Delcassé urged the Chamber to press for a reduction of the import duties on wines in Russia and other countries.—28th: The Chamber adopted the Bill modifying the electoral constituencies, omitting the clause extending the term to six years.

Germany.—5th: The Budget Committee decided to reject the Government demand for 1,550,000 marks for the extension of the German East African railway to Mombasa.—28th: Death of Prince Münster, formerly German Ambassador in London. 31st: Death of Dr. Liëber, the leader of the Centre Party in the Reichstag.

Italy.—3rd: The Pope's Pontifical Jubilee was inaugurated in St. Peter's.—7th: Death of Captain Casati.—8th: The Pope received the Special British Mission sent to congratulate him on his Jubilee. The proposed railway strike was averted by the Government.—10th: The Chamber re-assembled and Signor Brancheré was elected President.—23rd: Count von Bülow arrived at Venice to meet the Premier and Foreign Minister.—27th: Signor Prinetti interviewed Count von Bülow at Venice.

Japan.—10th: The Diet was closed.—12th: The foreign community at Kobe declined to pay house-tax.—17th: The Government decided to refer the house-tax question to arbitration.—21st: Baron Kodama resigned the portfolio of War, and was succeeded by Viscount Terauchi.—24th: The financial conditions in Japan were reported to be improving.

Persia.—20th: It was reported that an agreement had been made with Russia for a loan of 10,000,000 roubles, Russia to have a concession for a new road from Tabriz to Teheran.—28th: It was announced that the Shah would make a European tour, arriving at Craeow on May 12.

Russia.—11th: The University of St. Petersburg was re-opened to students.—13th: Lieut.-Col. Grimm, of the General Staff, was arrested for betraying military secrets to foreign powers.—16th: A revolutionary demonstration took place in the Nevski Prospect, the main street of St. Petersburg, but was suppressed.

Servia.—5th: A revolutionary attempt was made at Shabatz by an agitator, Alavanties, who was shot.—6th: The 20th anniversary of the proclamation of the Servian Kingdom was celebrated.—19th: The Ministry resigned.

Spain.—1st: Señor Pidal, the Spanish Ambassador to the Vatican, resigned and was succeeded by Señor Agüera.—11th: The sittings of the Cortes were suspended. Señor Urzaiz, Minister of Finance, tendered his resignation.—13th: Señor Sagasta's Ministry resigned.—14th: Arbitration treaties were concluded with Central and South American countries.—18th: Señor Sagasta formed a new Cabinet with the Duke of Almodovar as Minister of Foreign Affairs and General Weyler as Minister of War.—26th: A new session of Parliament was convoked for April 3.

Sweden.—12th: The Government introduced a Bill for the extension of Parliamentary suffrage.—21st: Sir W. A. C. Barrington was appointed British Minister at Stockholm.

Turkey.—3rd: Ibrahim Pasha was shot by Albanians for endeavouring to restrain their violence. General Shakir Pasha was arrested.—6th: The Embassies presented a collective note protesting against the systematic hindrances offered to Cretans in their dealings with Turks.—8th: Shakir Pasha was released.—11th: An agreement was made with the British Ambassador for the repurchase of the Haifa-Damascus railway.—13th: The town of Kiangri in Asia Minor was destroyed by an earthquake.—17th: Fuad Pasha was exiled; many arrests were made.—26th: Hassan Fehmi Pasha was appointed Vali of Salonika in succession to Tewfik Bey.

United States.—3rd: Prince Henry of Prussia arrived at St. Louis on his tour through the Western States.—4th: Prince Henry arrived at Chicago. The Senate Canal Committee recommended that the Panama Company's offer should not be accepted.—5th: The Boer delegates were received as private citizens by President Roosevelt and Mr. Hay. Prince Henry arrived at Niagara Falls and visited the Canadian side. 6th: Prince Henry received the honorary degree of LL.D. at Harvard. 8th: Prince Henry was entertained at dinner by President Roosevelt.—10th: Mr. Long, Secretary to the Navy, tendered his resignation as from May 1; he will be succeeded by Mr. W. H. Moody.—11th: Prince Henry left New York for Germany.—12th: The Hepburn Bill, providing for the construction of a canal by the Nicaraguan route, was passed by the House of Representatives.—27th: The House of Representatives appointed a committee to investigate charges of bribery in connection with the purchase of the Danish West Indies. The President sent a message to Congress asking it to create a mission to Cuba.

Venezuela.—1st: A fresh invasion from Colombia under Dr. Rangel Gardias was reported as having been repulsed near Lafries with great loss.

FORTHCOMING EVENTS.

UNITED KINGDOM.

London.—His Majesty's birthday will be celebrated this year on Friday, May 30, on which day the usual official dinners will be given.—A proclamation, issued in the *London Gazette*, appoints June 26 and 27 next as Bank holidays and public holidays. The Coronation Naval Review at Portsmouth will take place on the 28th June.—The Austro-Hungarian Chamber of Commerce and Industry in London announces that an exhibition of Austrian fine art and decorative furniture will be held at Prince's Skating Rink, Kensington, from May 15 to July 31 inclusive. The exhibition is being promoted by the Austrian Ministry of Commerce, and the Emperor of Austria is taking a keen interest in the enterprise, which will embrace within its scope everything that is new, original, or characteristic in Austrian decorative art. The chief feature of the exhibition will be a large number of *intérieurs* by the leading furniture firms of Vienna. It is hoped that the opening ceremony will be performed by the Austrian Minister of Commerce.—On the 9th inst. at the monthly dinner of the London Chamber of Commerce, the subject for discussion will be "WEST AFRICA"; Sir George Taubman-Goldie will preside.—On the 15th, at the Royal Colonial Institute, a lecture will be given by Sir Hubert Jerningham on COLONIAL ADMINISTRATION.—On the 23rd, at the monthly dinner of the London Chamber of Commerce, the subject for discussion will be "THE COAL TRADE."

Wolverhampton.—His Royal Highness the Duke of Connaught will open the ART AND INDUSTRIAL EXHIBITION at Wolverhampton on May 1st.

FOREIGN COUNTRIES.

Chili.—An INTERNATIONAL EXHIBITION of SCHOOL REQUISITES (furniture, apparatus and scientific instruments, books, etc.) will be held at Santiago in September next on the occasion of the General Congress of Public Learning which is to be held there.

Corea.—JAPANESE COMMERCIAL MUSEUM.—It is reported that the Fusan Chamber of Commerce has decided to establish

a commercial museum in Fusan, and that the Yokohama Chamber of Commerce has been requested to send exhibits.

Japan (Osaka).—The special building to be provided for foreign exhibits at the NATIONAL INDUSTRIAL EXHIBITION, to be held at Osaka in 1903, will have an area of five-sixths of an acre.

Russia—Poland (Vilna).—An AGRICULTURAL AND INDUSTRIAL EXHIBITION will be held this year at Vilna, between the 13th and 21st of September. The Exhibition will consist of thirteen departments, namely:—1. Agriculture. 2. Cattle, sheep, pigs, etc. 3. Dairy farming. 4. Horses. 5. Agricultural machinery and implements. 6. Horticulture. 7. Bee-keeping, silk growing. 8. Pisciculture and fishing. 9. Forestry and timber industry. 10. Farm building. 11. Agricultural and factory industries. 12. Hand manufactures and mining industries. 13. General science.

NAVAL AND MILITARY INTELLIGENCE.

NAVAL.

The Government have placed with private firms contracts for two new battleships, five first-class cruisers, and two third-class cruisers.

The *Iphigenia*, cruiser, Captain S. V. Y. de Horsey, which has been employed in the carrying of relief crews, was paid off on the 10th ult. at Portsmouth.

The *Wolf*, torpedo-boat-destroyer, left Devonport on the 13th ult. for Portsmouth to be placed at the disposal of the Committee on Torpedo-Boat-Destroyers.

The battleship *Barfleur*, at Devonport dockyard, is forthwith to be refitted for further service at a cost of £80,000. The work will probably occupy twelve months.

The torpedo-boat-destroyers *Charger*, *Dasher*, and *Vixen* were commissioned at Devonport on the 11th ult. to replace the *Leopard*, *Gipsy*, and *Leven* in the instructional flotilla.

The *Sulley*, cruiser, which is to be commissioned at Chatham on April 6 to take the place of the *Diadem* in the Channel Squadron, will have a complement of 755 officers and men.

On April 2 the torpedo-boat-destroyers *Fawn*, at Portsmouth, and *Mallard*, at Chatham, will be commissioned for service in the Mediterranean, where they will relieve the *Hardy* and *Conflict*. The *Mallard* has recently been stiffened.

The cruiser *Philomel*, recently returned from the Cape of Good Hope, and paid off on the 18th ult. at Devonport, will be prepared at Haulbowline for another commission at a cost of £20,000. The Admiralty have approved of several important alterations being made in her equipment.

The *Bulwark*, battleship, was commissioned at Devonport on the 18th ult. by Captain F. T. Hamilton. Admiral Sir C. E. Donville, when he assumes command of the Mediterranean Squadron, will hoist his flag at Devonport in the *Bulwark*, which will relieve the *Renown*, battleship, flagship of Admiral Sir John Fisher.

The *King Edward VII.*, and the sister ships *Dominion* and *Commonwealth*, will be the largest battleships yet built for any navy. They will displace 16,500 tons, and will introduce a disposition of armament and protection altogether new to the British fleet. The ships will have great coal capacity. Their complement will be nearly 1,000 men if used as flagships.

The Admiralty have informed the dockyards that, owing to the Coronation review, there will be no mobilisation of the fleet this year for the ordinary annual naval manoeuvres. In place of these will be the important manoeuvres to be carried out by the Mediterranean Fleet and the Channel and Cruiser Squadrons, supplemented by a large number of ships to be sent from England after the Naval Review.

The new battleship *Vengeance* will be commissioned on April 8 for service on the Mediterranean Station. The other five vessels of her class—i.e., the *Albion*, *Glory*, *Goliath*, and *Ocean*—are already in commission on the China Station, and the *Canopus* is serving in the Mediterranean. The station originally named for the *Vengeance* was China, but it is possible, now that the Anglo-Japanese understanding has been arrived at, we shall not further reinforce our fleet in Far Eastern waters. The first-class armoured cruiser *Aboukir* is also to go to the Mediterranean, and she is to commission on April 3 to relieve the *Theseus*, which has been in commission since January, 1899. The latter vessel, although a very fine and efficient cruiser, is neither as fast nor as powerful as the *Aboukir*.

The first-class armoured cruiser *Leviathan*, which has been built by contract at Clydebank, is nearly ready for delivery, and a navigating party was despatched to the Clyde on the 19th ult. for the purpose of conveying the vessel to Portsmouth Dockyard, where she will be completed for sea. The *Leviathan*, which is of 14,100 tons displacement, 30,000 horse-power, and an estimated full speed of 23 knots per hour, was laid down at Clydebank on the 30th November, 1899, and launched on the 3rd June, 1901. She will be the third of the four gigantic cruisers that were allowed for in the estimates of 1898-9, to be delivered—the *Good Hope* and *Drake* being already at Portsmouth. The *King Alfred*, which was launched at Barrow on the 28th October of last year, will complete this class of valuable vessels.

The *Prometheus*, a small third-class steel cruiser of 2,135 tons displacement, has lately been carrying out some very interesting steam trials, designed to determine the efficiency of her propellers under various conditions of working. In a recent experiment which has just been concluded at Portsmouth, it was found that with the latest adjustment of the pitch of her propellers she succeeded in obtaining the speed of 20.3 knots per hour, which is slightly in excess of her estimated full speed of 20 knots, and that she was able to obtain this very satisfactory result with the engines developing about 1,000 horse-power less than had been the case on previous occasions with other adjustments. As there are no less than eleven vessels of the *Prometheus* class in the navy, the successful alterations which have been made in this ship have a very important bearing upon the others of her class.

The battleship *Queen*, which was launched by Her Majesty at Devonport on the 8th ult., and the *King Edward VII.*, of which the King laid the keel-plate, in the dockyard there, represent very powerful types in the navy. The *Queen* displaces 15,000 tons, and is 400 ft. long, with 75 ft. beam and 26 ft. 9 in. draught. In her general characteristics she resembles the *Venerable*, *London*, and *Bulwark*, which are, practically, the same as the ships of the *Formidable* class, but with side armour extending much nearer to the bow. In the *Queen* the armour includes a Krupp steel belt, commencing some 30 ft. from the bow and running a distance of 220 ft. towards the after-part of the ship. It is 15 feet deep, and the armour-plates are 9 in. thick. There is a curved transverse bulkhead near the after barquette of 12 in. steel, and the barquettes themselves have plates varying from 6 in. to 12 in. A protective deck covers the vital parts, being 1 in. thick on the flat and 2 in. on the slopes, where it reinforces the side armour. In the matter of armament and speed, the *Queen*, like her sister ship, the *Prince of Wales*, which the Princess launched at Chatham on the 25th ult., marks a distinct advance on the *Venerable* class. The four 12-in. 50-ton wire-wound guns, with hoods of 8-in. and 10-in. armour, are the

same, but, instead of twelve 6-in. Vickers quick-firers, there are eight 7.5-in. modified quick-firers of a new and more powerful type, with ten of the 6-in. guns. There are also 18 12-prs. and a number of 3-pr. Hotchkiss and Maxim machine-guns. The ships of the *Venerable* class have a nominal speed of 18 knots, with 15,000 horse-power; but the *Queen*, with 20,000 horse-power, is to steam at 19 knots. She is to have Babcock and Wilcox boilers.

Chili.—The new battleships ordered by the Chilean Government to be built at Barrow and Newcastle-on-Tyne will be 435 ft. long, with 70 ft. beam, and will have a speed of 21 knots, with engines having 25,000 horse-power. Each ship will carry four 10-in. guns, 14 7.5 guns, and many smaller quick-firing guns. The vessels will cost slightly over £1,000,000 each, and are to be delivered within eighteen months.

France.—Rear-Admiral Eugène Albert Maréchal has been appointed to take command of the French naval division in the Far East, to succeed Admiral Edouard Pottier.

Russia.—The trials of the new Russian battleship *Pobieda*, which have recently taken place, have been fairly satisfactory, a mean speed of 18.5 knots having been registered on the measured mile. This vessel, which was laid down at the Baltic Works, at St. Petersburg, on February 18, 1899, and launched on May 24, 1900, is fitted with triple screws, driven by engines of an aggregate horse-power of 14,500; the maximum revolutions per minute of the engines are 115, but on the above trials they were run at from 104 to 110 revolutions per minute, and so the estimated speed of 19 knots per hour was not obtained. This speed, however, it is expected, will easily be procured when the vessel is put upon her full-power trials. The *Pobieda* is of 12,674 tons displacement, and is fitted with an installation of 30 boilers of the Belleville type. She is armed with four 10-in. and ten 6-in. guns, in addition to a smaller armament, and carries 724 officers and men. She is a sister vessel to the *Peresviet* and *Ossliabya*, which were also constructed at St. Petersburg.

MILITARY.

Major-General the Earl of Dundonald is to be offered the command of the Canadian Dominion Forces.

The recruiting returns for February show a marked improvement upon those issued for December and January.

Captain C. G. Pritchard, Royal Garrison Artillery, has been appointed Commandant of the Hong Kong Volunteers.

Major G. R. T. Rundle, R.F.A., has been appointed to command the 50th Brigade Division Royal Field Artillery at Woolwich.

The 2nd Battalion Cameron Highlanders which has been stationed at Gibraltar since 1899, has been ordered to embark for Crete at the end of the month.

Major the Hon. H. S. Davey, 18th Hussars, on promotion, has been appointed second in command of the 3rd Provisional Regiment of Hussars at Aldershot.

Lieut.-Colonel W. H. Williams, C.M.G., R.A., has, on promotion, been appointed to command the 28th Brigade Division Royal Field Artillery at Woolwich.

Lieutenant H. E. M. Douglas, V.C., D.S.O., Royal Army Medical Corps, who was wounded at Magersfontein, has been appointed for light duty in the Home District.

Major C. E. Mills, Prince of Wales's Own West Yorkshire Regiment, has been appointed to succeed Lieut.-Colonel G. Grant-Dalton in command of the 1st Battalion.

Major-General F. G. Slade, C.B., commanding the Royal Artillery at Gibraltar, has been appointed Inspector-General of Royal Garrison Artillery for a period of three years.

Captain the Hon. A. V. Meade, Royal Horse Guards, who has served on the staff in South Africa, has been selected for second-in-command of the 30th Battalion of Imperial Yeomanry.

General Sir George White arrived at Gibraltar on the 18th ult. from England, and resumed the supreme civil and military command.

Sir Hector MacDonald arrived on the 26th ult. at Colombo, to assume the command of the forces in Ceylon, in succession to Major-General Hobson.

Colonel Lord Hardinge 7th (Tower Hamlets Militia) Battalion of the Rifle Brigade, is to be appointed an Aide-de-Camp on the staff of Lord Roberts.

Lieut.-Colonel F. W. T. Attree, R.E., has been appointed Commanding Royal Engineer of the South Wales Sub-District, in place of Colonel H. H. Muirhead, who retires on April 4.

All available men of the details of the Hampshire Regiment, at Aldershot, are also to be in readiness to embark for South Africa about April 15. This draft will go out very strong.

The Commander-in-Chief has approved of Lieut.-Colonel the Hon. J. E. Lindley, now temporarily commandant of the Imperial Yeomanry School at Aldershot, being confirmed in that appointment to complete five years.

Major W. E. Fairholme, C.M.G., Royal Artillery, now on Sir General Sir George White's Staff at Gibraltar, is to be Military Attaché in Vienna, succeeding Colonel F. M. Wardrop, C.B.

The King has been pleased to approve of the appointment of Lieut.-Colonel E. J. Swayne, Indian Staff Corps, to be H.M. Commissioner and Consul-General in the Somali Coast Protectorate.

Lieutenant H. S. Moberly, Indian Staff Corps, serving with the Hong Kong Regiment, has been appointed Aide-de-Camp to Major-General Sir A. R. F. Dorward, commanding at Shanghai.

Major-General Frederick George Slade, C.B., who has been commanding the Royal Artillery at Gibraltar since March, 1899, returns to England to take over the post of Inspector-General of Garrison Artillery at the War Office from the 1st inst.

A cheque for £500 "to help in meeting the expenses connected with the erection of the new Soldiers' Home in Buckingham-palace-road," has been forwarded to Sir George Chubb from an old Guardsman through the Brigade Major, Brigade of Guards.

Colonel Sir Charles Parsons, K.C.M.G., Assistant Adjutant-General in the Woolwich District, has been appointed a Colonel on the Staff, to command the Regular troops in the Dominion of Canada, with the local rank of Major-General. The appointment has been reduced from a Lieut.-General's post.

Orders have been issued for drafts of the Derbyshire, Royal Irish, and Cheshire Regiments, and South Wales Borderers, at Aldershot, to be prepared by the officer commanding the 2nd Provisional Battalion to embark in the middle of April for South Africa.

Colonel Sir James Willcocks, D.S.O., recently arrived from South Africa, left England on the 13th ult. to assume the command of the Belgum second-class district, to which he has been appointed in succession to Sir Hector MacDonald, D.S.O., who has been appointed to the command of the troops in Ceylon.

Colonel J. M. Hunt, 2nd Battalion Cameron Highlanders, temporarily commanding the Infantry Brigade at Gibraltar, is to be appointed to the command of the 91st (Argyll and Sutherland Highlanders) Regimental District; and Colonel E. J. Gallwey, C.B., 2nd Battalion Somersetshire Light Infantry, to the command of the 13th (Somersetshire) Regimental District.

STATISTICAL NOTES.

Foreign Trade and Commerce.—Accounts are published relating to the trade and commerce of certain British Possessions and foreign countries, from which the following figures are taken, showing the total imports and exports of the principal countries for which the particulars can be given up to December, 1901, inclusive, and referring in all cases to the same period, namely, the twelve months January—December. The corresponding figures for 1900 are added for comparison:—

12 months ended December.	Imports.		Exports.	
	1900.	1901.	1900.	1901.
Germany	288,281,000	283,827,000	230,569,000	283,850,000
Belgium*	85,871,000	88,226,000	74,266,000	73,092,000
France	187,912,000	188,582,000	164,348,000	166,647,000
Spain*	34,769,000	33,552,000	29,310,000	26,818,000
Italy	68,009,000	68,704,000	53,530,000	54,981,000
Austria-Hungary	70,682,000	70,933,000	80,917,000	78,716,000
Egypt	14,480,000	15,642,000	17,204,000	16,140,000
United States	172,740,000	183,421,000	302,710,000	299,601,000
Japan	29,057,000	25,902,000	19,651,000	25,288,000
British India	48,005,000	55,404,000	68,246,000	77,347,000
Canada	36,021,000	38,434,300	34,929,200	38,084,500
United Kingdom	523,075,000	522,239,000	291,192,000	280,499,000

*Value of principal articles only.

In the case of Germany, Belgium, France, Italy, Austria-Hungary, Japan, and Canada, the import figures given in the above summary represent imports for home consumption only. In all cases the export figures represent exports of domestic produce.

METRICAL WEIGHTS AND MEASURES.

TABLES FOR CONVERTING METRICAL WEIGHTS AND MEASURES.

HECTARE.	ACRE.	KILO-MÈTRE.	ENG. MILE.	SQUARE	
				KILO-MÈTRE.	ENG. MILE.
0.405	1	2.471	1.609	1	0.386
0.809	2	4.942	3.219	2	0.772
1.214	3	7.413	4.828	3	1.158
1.619	4	9.885	6.438	4	1.544
2.023	5	12.356	8.047	5	1.930
2.428	6	14.827	9.656	6	2.316
2.833	7	17.298	11.265	7	2.702
3.237	8	19.769	12.875	8	3.088
3.642	9	22.240	14.484	9	3.474
4.047	10	24.711	16.093	10	3.860
8.093	20	49.423	32.186	20	7.720
12.140	30	74.134	48.279	30	11.580
16.187	40	98.846	64.373	40	15.440
20.234	50	123.557	80.466	50	19.300
24.286	60	148.268	96.559	60	23.160
28.327	70	172.980	112.652	70	27.020
32.373	80	197.692	128.745	80	30.880
36.420	90	222.403	144.839	90	34.740
40.467	100	247.114	160.932	100	38.601

MÈTRE.	YARD.	KILO-GRAMME.	LB. AVOIR.	LITRE.	GAL- LONS.
0.914	1	0.454	1	4.54	1
1.829	2	0.907	2	9.09	2
2.743	3	1.361	3	13.63	3
3.658	4	1.814	4	18.17	4
4.572	5	2.268	5	22.72	5
5.486	6	2.722	6	27.26	6
6.401	7	3.175	7	31.80	7
7.315	8	3.629	8	36.35	8
8.229	9	4.082	9	40.89	9
9.144	10	4.536	10	45.43	10
18.288	20	9.072	20	90.87	20
27.432	30	13.608	30	136.30	30
36.576	40	18.144	40	181.74	40
45.719	50	22.679	50	227.17	50
54.863	60	27.215	60	272.61	60
64.007	70	31.752	70	318.04	70
73.151	80	36.288	80	363.48	80
82.295	90	40.823	90	408.91	90
91.438	100	45.359	100	454.35	100

For the use of these tables the following explanation is necessary:—The figures in heavier type represent either of the columns beside it, as the case may be; viz., with hectares and acres in the first set of columns, 1 acre=0.405 hectare, and vice versa, 1 hectare=2.471 acres, and so on.

Consumption of Coal in France.—The Commission appointed to report upon the mineral production of France has terminated its labours, and, dealing with the production and consumption of coal in 1900, states that in that year the rise in the price was higher than it had been since 1873. The average price at the pit's mouth was nearly 12s. a ton, this being 2s. per ton higher than in the previous year. The report of the Commission attributes this rise to the general strike of miners in the South Wales coal mines and to the exceptional demand for coal, owing to the Transvaal war, and the requirements of the transport service. The consumption of coal in France for that year was 48,803,000 tons, or 3,575,000 tons more than in the preceding year. The production of the French coal mines is only 33,404,000 tons, and the imports for 1900 were 16,177,000 tons, or nearly half the total production. Just half of this came from England, while Belgium supplied 5,330,000 tons and Germany 1,615,000 tons, a small quantity coming—for the first time—from the United States. The total value of the output of coal at the pit's mouth is estimated at £20,000,000, or about £3,600,000 more than in the preceding year, and of this large sum £8,600,000 represents the wages paid to 162,100 men employed in the mines.

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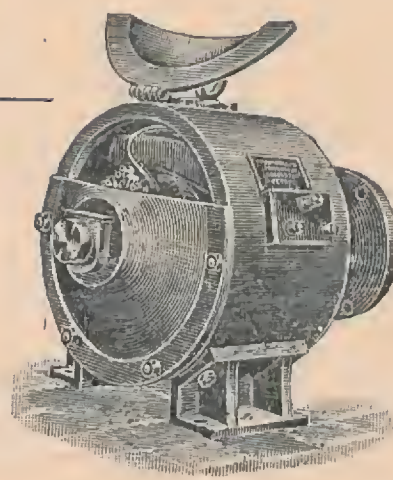
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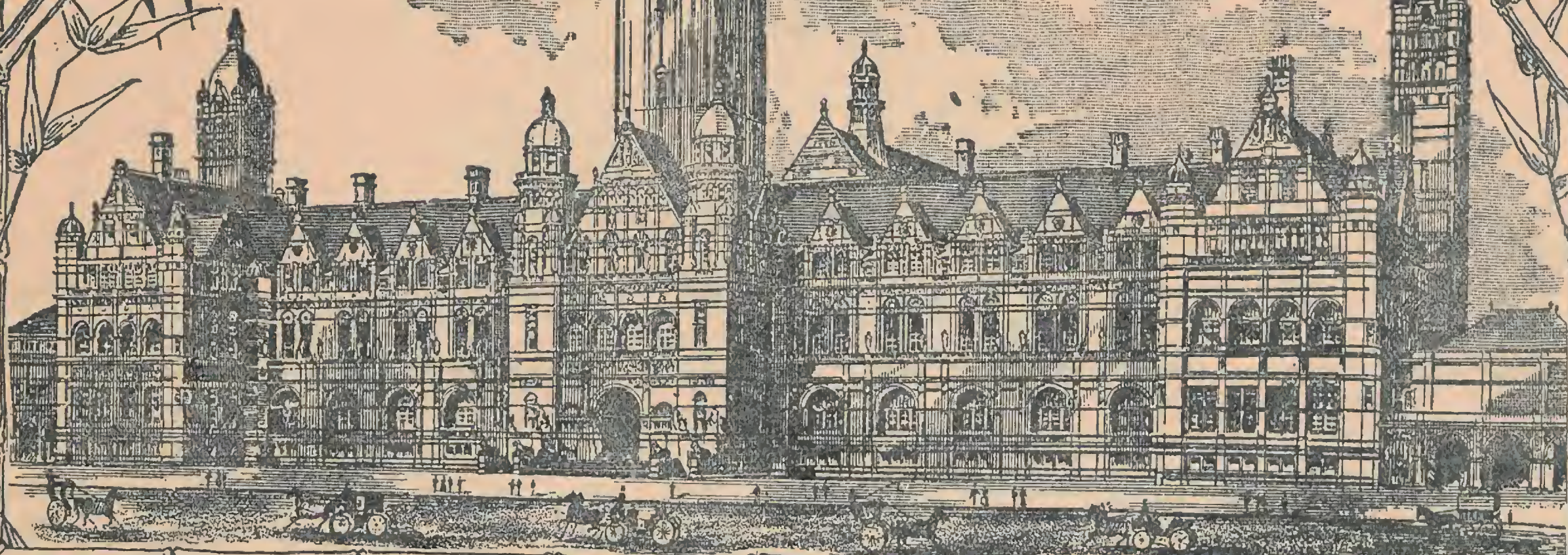
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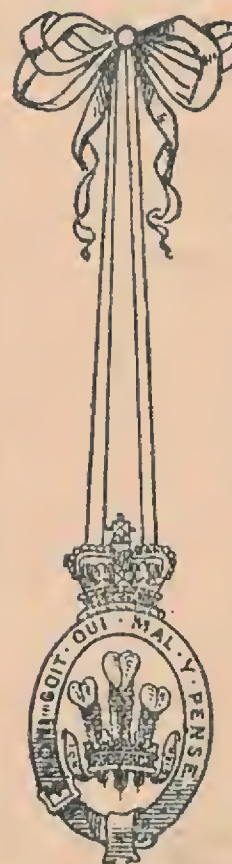
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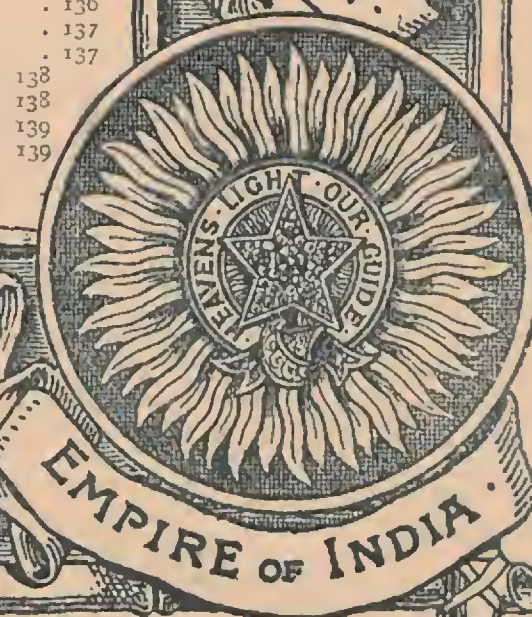
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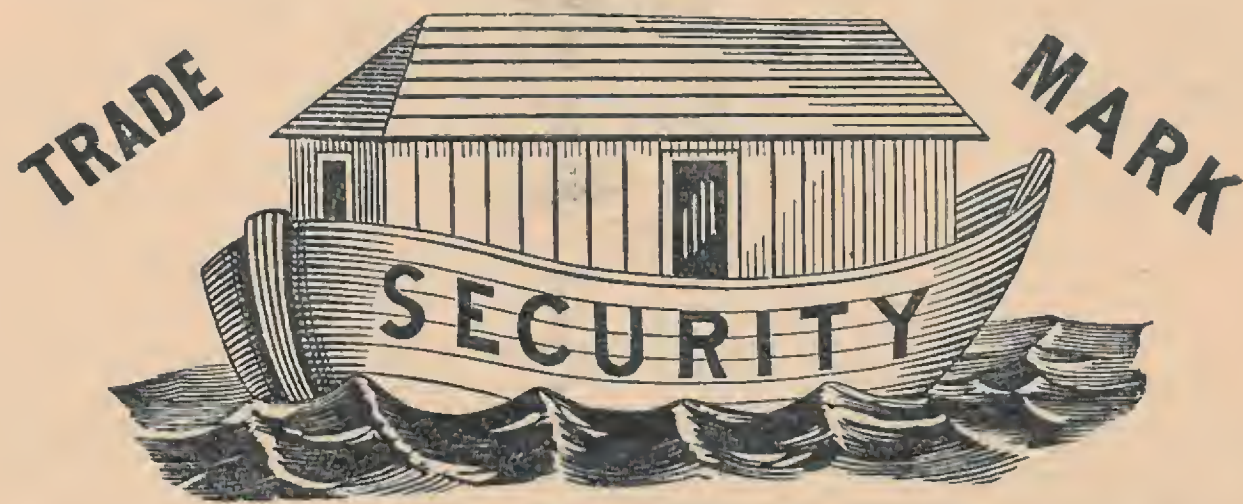
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India.—See under BRITISH INDIA, on page 118.

Canada.—Quebec: THE COMMISSIONER OF AGRICULTURE.

Ontario: THE DIRECTOR OF MINES, Toronto.

New Brunswick: THE PROVINCIAL SECRETARY.

Manitoba: THE PROVINCIAL SECRETARY.

West Indies.—Jamaica: THE INSTITUTE OF JAMAICA.

Grenada: THE COLONIAL SECRETARY.

St. Vincent: THE ADMINISTRATOR.

St. Lucia: Mr. T. H. DIX.

Trinidad and Tobago: THE COLONIAL SECRETARY.

Bermuda: THE COLONIAL SECRETARY.

Natal and Zululand: Mr. C. B. LLOYD, Commissioner of Agriculture, Natal.

Gold Coast.—[VACANT.]

Straits Settlements.—The COLONIAL SECRETARY at (Singapore).

State of Johor.—The DATO JAMES MELDRUM.

Mauritius.—Mr. A. DARUTY DE GRANDPRÉ, Superintendent of the Museum.

Seychelles.—The Hon. E. B. SWEET-ESCOTT, C.M.G., Administrator.

Hong Kong.—The HARBOUR MASTER.

Fiji.—Hon. JOHN HILL, Suva, Fiji.

Victoria.—The MELBOURNE EXHIBITION TRUSTEES.

Tasmania.—Mr. GEO. STEWARD, Under Secretary for Tasmania.

In the case of several Colonies correspondence is carried on through the Agent-General's Office or through the Representative Governor.

THE COMMERCIAL COLLECTIONS OF THE INSTITUTE.
BRITISH AFRICA.

(*West Central Lower Gallery.*)

CAPE COLONY.

Representative Governors.—Mr. THOMAS E. FULLER (Agent-General).

[ONE VACANCY.]

Corresponding Agent in Colony.—(At present through the Agent-General's Office).

Curator of Collection.—Mr. LEWIS ATKINSON.

Products Exhibited.—Agricultural produce, building stones, coal dried fruits, furs minerals (including asbestos, gold-bearing quartz, copper ores, diamondiferous gravel etc.), stuffed ostriches, ostrich eggs and feathers, Angora hair, tobacco, wines, wools, etc

NATAL. (*West Central Lower Gallery*)

Representative Governor.—SIR WALTER PEACE, K.C.M.G.

Corresponding Agent in Colony.—Mr. C. B. LLOYD, Commissioner of Agriculture and Mines, Natal.

Curator of Collection.—(In charge of Institute Staff.)

Products Exhibited.—Agricultural produce, Angora hair, tanning barks, building stones, coffee, cutlery, indigenous timbers, minerals, coal, silk cocoons, spirits, sugar, tea, tobaccos, wine, wools, native ornaments, etc., etc.

RHODESIA AND BECHUANALAND.

(*West Central Lower Gallery.*)

Representative Governors.—Those of CAPE COLONY.

Curator of Collection.—Mr. LEWIS ATKINSON.

Products Exhibited.—Specimens of native workmanship kindly lent by the late

[Queen Victoria.

NYASSALAND, BRITISH CENTRAL AFRICA.

(*West Central Lower Gallery.*)

Products Exhibited.—(By the British Central Africa Chamber of Agriculture and Commerce).—Coffee, ivory, *Landolphia* rubber, chillies, *Strophanthus* seeds, beeswax, photographs, etc.

BRITISH AMERICA.

(*West and Upper West Central Galleries.*)

DOMINION OF CANADA.

Representative Governor.—The Rt. Hon. the LORD STRATHCONA and MOUNT-ROYAL, G.C.M.G., *High Commissioner for the Dominion of Canada.*

Curator of Collections.—Mr. HARRISON WATSON.

PROVINCE OF QUEBEC.

Representative Governors.—The Hon. F. G. M. DECHÈNE and The Rt. Hon. the LORD STRATHCONA and MOUNT-ROYAL, G.C.M.G., *High Commissioner for the Dominion of Canada.*

Corresponding Agent in Province.—The COMMISSIONER OF AGRICULTURE.

Products Exhibited.—Canadian furs from Hudson's Bay Co., stuffed birds, wood pulp, slates, vehicles, minerals (asbestos, apatite, mica, plumbago, etc.), agricultural produce, fruits, tobacco, maple sugar, timber, Indian ornamental work, cotton, linen, and leather, and iron manufactures.

THE COMMERCIAL COLLECTIONS OF THE INSTITUTE—*continued.*

BRITISH AMERICA—*continued.*

DOMINION OF CANADA—*continued.*

PROVINCE OF ONTARIO.

Representative Governors.—SIR HENRY TYLER and JOHN PATON, Esq.

Corresponding Agent in Province.—Mr. ARCHIBALD BLUE, Director of Mines, Toronto.

Products Exhibited.—Agricultural produce, preserved fruits, indigenous timbers, gold, silver, iron, lead, and nickel ores, petroleum, marble, granite and decorative stones, coal, native wines, honey, canned meats, and woodwork.

PROVINCE OF BRITISH COLUMBIA.

Representative Governor.—The Hon. J. H. TURNER (Agent-General).

Corresponding Agent in Province.—(At present through Agent-General's Office.)

Products Exhibited.—Agricultural produce, coal, Douglas fir and other timbers, minerals, preserved fruit, tinned salmon, fish oils, woodwork, birds, and animals.

PROVINCE OF NEW BRUNSWICK.

Representative Governor.—C. A. DUFF MILLER, Esq., Agent-General.

Corresponding Agent in the Province.—The PROVINCIAL SECRETARY.

Products Exhibited.—Timbers, minerals, building stones.

PROVINCE OF MANITOBA.

Representative Governor.—The Rt. Hon. the LORD STRATHCONA and MOUNT-ROYAL, G.C.M.G.

Corresponding Agent in Province.—The PROVINCIAL SECRETARY.

Products Exhibited.—Agricultural produce (including barley, beans, corn, oats, peas, rye, wheat, flour, &c.); birds, comprising ducks, grouse, partridges, snipe, etc.; heads of wapiti, caribou, moose and other large game; specimens of native workmanship, photographs, head-dresses, clubs, arrows, beadwork, etc., etc.

PROVINCE OF NOVA SCOTIA.

Representative Governor.—JOHN HOWARD, Esq., Agent-General.

Corresponding Agent in Province.—(At present through Agent-General's Office.)

Products Exhibited.—Minerals, samples of iron ore and products manufactured from the ore, wood-wool.

NORTH-WEST TERRITORIES.

Representative Governor.—THOMAS SKINNER, Esq.

Corresponding Agent in Province.—(At present through the Representative Governor.)

Products Exhibited.—Grain.

NEWFOUNDLAND.

(Upper West Central Gallery.)

Representative Governor.—[VACANT.]

Corresponding Agent.—

Products Exhibited.—Minerals (including ores of iron, copper, manganese, chromium, lead, antimony and zinc, molybdenite, mispickel, mica, asbestos, steatite, granite, marble, slate, coal, and petroleum) and timber.

BERMUDA.

(Middle of Central Lower Gallery.)

Representative Governor.—Gen. SIR ROBERT BIDDULPH, G.C.B., G.C.M.G.

Corresponding Agent.—THE COLONIAL SECRETARY.

Products Exhibited.—Arrowroot, woods, silk, shell-work, and sandstone.

WEST INDIES.

(West Central Lower Gallery.)

BRITISH GUIANA, TRINIDAD, AND TOBAGO.

Representative Governor.—The Rt. Hon. the LORD STANMORE, G.C.M.G.

Corresponding Agent.—Trinidad and Tobago: THE COLONIAL SECRETARY.

Curator of Collection.—(In charge of Institute Staff.)

Products Exhibited.—Arrowroot, cereals and pulses, medicinal barks, cocoa, coral, coffee, indigenous timbers, lace, fibres, rum, spices, starches, sugars, timber, leather, skins, drugs, fish glue, basket-work, condiments, etc.

JAMAICA AND BAHAMAS, WINDWARD ISLANDS, AND BARBADOS.

Representative Governor.—Gen. SIR HENRY W. NORMAN, G.C.B., G.C.M.G., C.I.E.

Corresponding Agent.—Jamaica: THE INSTITUTE OF JAMAICA.

Hon. Curator.—[VACANT.]

Products Exhibited.—Arrowroot, barks, cocoa, coral, coffee, indigenous timbers, lace-bark, fibres, rum, spices, starches, sugars, sarsaparilla, wax, oils, condiments, turtle, etc.

BRITISH HONDURAS.

Representative Governor.—J. McMURRICH CURRIE, Esq.

Corresponding Agent.—[VACANT.] *Hon. Curator of Collection.*—J. M. CURRIE, Esq.

Products Exhibited.—Banana and cassava meal, cocoanut oil, coffee, horns (deer), indiarubber, Indian corn, medicinal barks, pickles, preserved fruits, rice, rope and cordage of native manufacture, rum, seeds edible and ornamental, spices, sponges, sugar, mahogany and other timbers, tobacco, etc.

LEEWARD ISLANDS.

Representative Governor.—[VACANT.]

Corresponding Agents.—Grenada: THE COLONIAL SECRETARY.

St. Vincent: THE ADMINISTRATOR.

St. Lucia: MR. T. H. DIX.

Products Exhibited.—Arrowroot, barks, cocoa, coral, coffee, indigenous timbers, fibres, rum, spices, starches, sugars, etc., etc.

FALKLAND ISLANDS. (Middle of Central Lower Gallery.)

Representative Governor.—Gen. SIR ROBERT BIDDULPH, G.C.B., G.C.M.G.

Corresponding Agent.—THE COLONIAL SECRETARY.

Products Exhibited.—Wool, birds' skins and eggs.

BRITISH AUSTRALASIA.

NEW SOUTH WALES.

(East Central Upper and Lower Galleries.)

Representative Governor.—The Hon. HENRY COPELAND (Agent-General), and SIR DANIEL COOPER, Bart., G.C.M.G.

Corresponding Agent in Colony.—(At present through Agent-General's Office.)

Products Exhibited.—Minerals (including gold, silver, coal, &c.), wool, indigenous timbers, wines, cereals, seeds, gums, resins, oils, fibres, rope, leather, tallow, etc., etc.

VICTORIA.

(East Central Upper and Lower Galleries.)

Representative Governors.—HOWARD SPENSLEY, Esq., and [VACANT].

Corresponding Agents in Colony.—(At present through Agent-General's Office.)

Officer in Charge of Collection.—Mr. A. G. BERRY (of the Agent-General's Office.)

Products Exhibited.—Animals, birds, coal, cereals, chemical manufactures, cigars, essential oils, gums, grain, hops, indigenous timbers, leather, leatherware, minerals (including auriferous quartz, coal, kaolin, etc.), models of gold nuggets, seeds, sugar, tobacco, wines, wool, etc., etc.

SOUTH AUSTRALIA.

(East Central Lower Gallery.)

Representative Governors.—H. A. GRAINGER, Esq. (Agent-General), and HENRY BULL TEMPLAR STRANGWAYS, Esq.

Corresponding Agent in Colony.—(At present through Agent-General's Office.)

Officer in Charge of Collection.—Mr. EDMUND SNEEL (of the Agent-General's Office.)

Products Exhibited.—Agricultural produce, wines, indigenous timbers, furniture, wool, etc.

QUEENSLAND (AND BRITISH NEW GUINEA).

(East Central Lower Gallery.)

Representative Governors.—The Hon. SIR HORACE TOZER, K.C.M.G. (Agent-General), and Gen. SIR HENRY W. NORMAN, G.C.B., G.C.M.G., C.I.E.

Corresponding Agent in Colony.—(At present through Agent-General's Office.)

Curator of Collection.—(In charge of Institute Staff.)

Products Exhibited.—Building stones, eucalyptus oils, fibres, minerals, pearl shells, indigenous woods, cereals, models of fruits, sugar, wine, tinned meats, hides, skins, leather, etc., etc.

WESTERN AUSTRALIA. (East Central Lower Gallery.)

Representative Governor.—The Hon. H. B. LEFROY (Agent-General).

Corresponding Agent in Colony.—(At present through Agent-General's Office.)

Curator of Collection.—(In charge of Institute Staff.)

Products Exhibited.—Wools, gums and resins, olive oil, fibrous barks, silk, skins, indigenous woods, minerals, model gold ingots, etc., etc.

TASMANIA. (East Central Lower Gallery.)

Representative Governor.—The Hon. ALFRED DOBSON (Agent-General).

Corresponding Agent in Colony.—Mr. T. C. JUST, Chief Secretary's Office, Hobart.

Curator of Collection.—(In charge of Institute Staff.)

Products Exhibited.—Cereals, minerals, models of fruits, stuffed fish, furs, timbers, illustrations of local manufactures, etc., etc.

NEW ZEALAND. (East Central Lower Gallery.)

Representative Governors.—The Hon. W. P. REEVES (Agent-General), and THOMAS MACKENZIE, Esq. *Corresponding Agent in Colony.*—(At present through Agent-General's Office.)

Curator of Collection.—(In temporary charge of Institute Staff.)

Products Exhibited.—Agricultural produce, building stones, coal, Kauri gum, hemp and flax, tinned meats, wools, tobacco, Kauri and other woods, with illustrations of their application to structural and ornamental purposes; photographs, etc., etc.

FIJI. (Middle of Central Lower Gallery.)

Representative Governor.—Gen. SIR ROBERT BIDDULPH, G.C.B., G.C.M.G.

Corresponding Agent in Colony.—Hon. JOHN HILL, Suva.

Curator of Collection.—(In charge of Institute Staff.)

Products Exhibited.—Barks, fibres, copra, tea, cocoa, coffee, timbers, etc.

BRITISH INDIA (AND ASIA).

INDIA. (East Gallery and Pavilion.)

Representative Governors.—Vide p. 116.

Special Sub-Committee, in charge of the Indian Section (appointed by the Secretary of State for India in Council):—*Chairman:* Major-General SIR OWEN TUDOR BURNE, G.C.I.E., K.C.S.I.

Members: SIR GEORGE C. M. BIRDWOOD, K.C.I.E., C.S.I.; G. W. VIDAL, Esq., I.C.S.; SIR E. C. BUCK, K.C.S.I.; W. COLDSTREAM, Esq., I.C.S., B.A.; C. H. MOORE, Esq.; T. W. HOLDERNESS, Esq., C.S.I.; SIR CHARLES J. LYALL, K.C.S.I., C.I.E.; Major-General JAMES WATERHOUSE.

Secretary: Mr. J. R. ROYLE, C.I.E.

Channel of Correspondence.—THE REVENUE AND AGRICULTURAL DEPARTMENT, INDIA.

Curator of Collection.—Mr. J. R. ROYLE, C.I.E.

Products Exhibited.—Fodder grasses, foods and food stuffs, sugar, spices and condiments, models of fruits, narcotics (including opium, ganja, etc.), tobacco and cigars, tea and coffee, oils and oil-seeds (including those of castor, sesamum, linseed, cocoa-nut and ground nut, etc.), a large assortment of drugs, dyes and tans, gums and resins (including the resins and turpentine of Indian pines, wax, lac, etc.), an extensive collection of fibres (including cotton, silk, jute, coir, rhea, agave, etc.), models illustrating the manufacture of cotton and jute, minerals (including building stones, coal, mica, soapstone, corundum, iron ores, steel, etc.), timbers, collection of Indian pottery, carved woodwork, silver, brass and copper ware, silk and cotton fabrics.

CEYLON. (East Gallery.)

Representative Governor.—The Rt. Hon. the LORD STANMORE, G.C.M.G.

Executive Officer and Home Agent.—FREDK. H. M. CORBET, Esq., Barrister-at-Law.

Curator of Collection.—Mr. J. R. ROYLE, C.I.E.

Products Exhibited.—Cereals, pulses, edible fruits, roots and grains, spices and condiments, drugs, horns, skins, pearls, shells, wax, oils, gums, resins, dyes, tans, fibres, timbers, building stones, plumbago, metallic ores, rough gems, palm products, tea, coffee, cocoa, cinchona bark, sugar, tobacco, cotton-cloth, mats, rattan and basket work, wood and ivory carving, metal-work, pottery, tortoise-shell and porcupine quill work, lacquer work, lace, etc., etc.

STRAITS SETTLEMENTS (AND JOHOR).

(East Gallery.)

Representative Governor.—SIR CECIL CLEMENTI SMITH, G.C.M.G.

Corresponding Agents.—The COLONIAL SECRETARY (at Singapore); The Dato JAMES MELDRUM (for Johor). *Curator of Collections.*—(In charge of Institute Staff.)

Products Exhibited.—Barks, canes, drugs, fibres, preserved fruits (including Singapore pine-apples), mats, silk fabrics, oils and oil-seeds, dyes and tans, gums, gutta-percha, tin ores and other minerals, teas, coffee, spices, timbers, etc., etc.

MAURITIUS (AND SEYCHELLES).

(West Central Lower Gallery.)

Representative Governor.—[VACANT.]

Corresponding Agent in Colony.—Mr. A. DARUTY DE GRANDPRÉ, Museum Superintendent.

Corresponding Agent for Seychelles.—The Hon. E. B. SWEET-ESCOTT, C.M.G., Administrator.

Curator of Collection.—(In charge of Institute Staff.)

Products Exhibited.—Fibres, hemp, oils, rum, seeds, sugars, tortoise-shell, vanilla beans, with specimens of native workmanship, etc., etc.

HONG KONG. (Middle of Central Lower Gallery.)

Representative Governor.—SIR WILLIAM ROBINSON, G.C.M.G.

Corresponding Agent in Colony.—THE HARBOUR MASTER.

Curator of Collection.—(In charge of Institute Staff.)

Products Exhibited.—China, carved and inlaid ivory and wood-work, silver and lacquer ware, silk and cotton fabrics, drugs, paints, dyes, food stuffs, etc., etc.

BRITISH NORTH BORNEO. (West Central Lower Gallery.)

Corresponding Agent.—(At present through the British North Borneo Co.)

Curator of Collections.—(In charge of Institute Staff.)

Products Exhibited.—Timbers, rattans, coal, rice, sago, sugarcane and raw sugar, coffee, cocoa pods, pepper, tobacco, beeswax, camphor, gutta-percha, kapok fibre, dammars, cutch and gambier, hemp, honey, etc.

BRITISH POSSESSIONS (EUROPE).

MALTA, GIBRALTAR, AND CYPRUS.

(West Central Gallery.)

Representative Governor.—Gen. SIR ROBERT BIDDULPH, G.C.B., G.C.M.G.

Corresponding Agent.—(At present through the Representative Governor.)

Curator of Collections.—(In charge of Institute Staff.)

Products Exhibited.—From Malta—Carved stone-work, lace, macaroni, honey, various fabrics, models, pictures, etc., etc. Gibraltar and Cyprus—None at present.

IMPERIAL INSTITUTE JOURNAL.

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GENERAL NOTICES.

"THE IMPERIAL INSTITUTE JOURNAL."

Fellows resident in the United Kingdom, the Colonies, India, and Foreign Countries, are supplied with the JOURNAL free by post each month.

The Subscription to the JOURNAL from other than Fellows, both at home and abroad, is as follows, including Postage, and Posted Monthly:—

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The JOURNAL may also be purchased for Sixpence each copy at the Ticket Office of the Institute and at the railway book-stalls of Messrs. WILLING & Co.

The City Agents for the JOURNAL are Messrs. WILLING & Co., 17, Royal Exchange, London, E.C. It may also be obtained at the offices of the printers, WATERLOW & SONS LIMITED, Blomfield-house, London-wall, London, E.C.

Communications respecting Advertisements should be addressed to the ADVERTISEMENT MANAGER, 6, Arundel-street, Strand, London, W.C.

This JOURNAL is distributed (by post) throughout the United Kingdom, India, and the Colonies of the British Empire, and to the following Foreign Countries:—Argentine Republic, Austria-Hungary, Belgium, Bolivia, Chili, China, Colombia, Costa Rica, Denmark, Egypt, France, Germany, Greece, Hawaiian Islands, Holland, Italy, Japan, Mexico, Montenegro, Morocco, Norway, Persia, Peru, Portugal, Russia, Siam, Spain, Sweden, Switzerland, Tripoli, Turkey, United States of America, Uruguay, and Venezuela. The JOURNAL is also placed in the Reading Rooms of CHAMBERS OF COMMERCE, CLUBS, and HOTELS, both at home and abroad.

SPECIAL NOTICE.

EXHIBITION OF GIFTS AND ADDRESSES PRESENTED TO THE PRINCE AND PRINCESS OF WALES, DURING THEIR COLONIAL TOUR IN 1901.

His Royal Highness the PRESIDENT of the IMPERIAL INSTITUTE has decided that an EXHIBITION shall be held in the North Gallery of the Institute of the GIFTS and ADDRESSES presented to their Royal Highnesses the PRINCE AND PRINCESS OF WALES on the occasion of their visiting the Colonies in 1901. The Exhibition will be open to the Public (Admission 1s.) on the 15th inst., from 11 a.m. to 7 p.m., and until further notice. The PRINCE OF WALES has also decided that the proceeds of the Exhibition shall be added to the "CORONATION GIFT" to KING EDWARD'S HOSPITAL FUND.

SPECIAL EXHIBITION OF COLONIAL PRODUCTS AND INDUSTRIES.

A Special Exhibition of Collections illustrative of the Mineral Wealth and of certain Industries of the DOMINION OF CANADA, also of commercial products from QUEENSLAND and from RHODESIA, will be on view on and after the 15th inst., in the western half of the North Gallery, from 11 a.m. to 7 p.m., on week-days—Admission Free.

The whole of the Collections at the Institute will be open until 7 p.m. during the continuance of the Exhibition of Gifts and Addresses.

FELLOWS' DEPARTMENT.

The Reading, Writing, and News Rooms, are open for the use of Fellows every week-day from 10 a.m. till 11.30 p.m., and on Sundays from 3 p.m. to 10.30 p.m. The Library (on the First Floor), is open from 10 a.m. to dusk on Week-days, and from 3 p.m. to dusk on Sundays. The Map Room (First Floor) is open from 10 a.m. to 5 p.m. on Week-days.

The Poste Restante is open every week-day for receipt and delivery of letters and parcels. Letters addressed to initials only are not received, except in reply to notices in the JOURNAL, under "Requirements" Registry. The General Post Office Pillar Box is cleared daily twelve times, between 10.10 a.m. and midnight. Light refreshments only are, for the present, provided in the Fellows' Rooms and at the bar of the Ceylon Kiosk.

EMIGRATION INFORMATION OFFICE.

The Office of the British Women's Emigration Association (see page 134), in the West Corridor, First Floor, is open daily from 10 a.m. to 4 p.m., and advice and information respecting emigration and openings in the Colonies may be obtained there free of charge. Enquiries of all kinds relating to the Colonies from intending Emigrants are dealt with in the Commercial Intelligence Department, and special information respecting Canada and the Cape Colony may also be obtained from the Curators for these Colonies, on application personally at their offices, or by letter.

SCHOOL OF MODERN ORIENTAL STUDIES.

An "Ouseley" Scholarship of £50 per annum, tenable for two years, will be awarded, should sufficient merit be shown, for proficiency in PERSIAN. No person will be admitted to competition for a Scholarship in a language which is his own mother tongue, nor for a Scholarship in a language allied to his mother tongue. The examination will take place early in July next. Full particulars may be obtained of the Secretary to the School, Imperial Institute. (For further information see page 133.)

SCIENTIFIC AND TECHNICAL DEPARTMENT.

The Scientific and Technical Department of the Institute has been established to acquire information by special enquiries and by experimental research, technical trials and commercial valuation regarding new or little known natural or manufactured products of the various Colonies and Dependencies of the British Empire and of foreign countries, and also regarding known products procurable from new sources, and local products of manufacture which it is desired to export. This work is carried out with a view to the creation of new openings in trade, or the promotion of industrial developments.

In the extensive and well-equipped series of Research Laboratories occupying the West Corridor of the Second Floor, a staff of skilled Chemists, under the direction of Professor Wyndham R. Dunstan, M.A., F.R.S., carry out the investigation of the chemical constitution and properties of new dye-stuffs, tanning materials, seeds and food-stuffs, oils, gums and resins, fibres, timbers, medicinal plants and products; animal products, minerals and ores, soils, cements, and various other products, with a view to their commercial utilization. Whenever necessary these materials are submitted to special scientific experts, by whom they are made the subjects of particular investigation or practical tests. Reports are also obtained from technical or trade-experts in regard to the probable commercial or industrial value of any such products, whilst full information is collected from official or other trustworthy sources regarding the probable extent and cost of available supplies. All materials requiring scientific or technical examination, or commercial valuation, should be submitted to the Institute for examination either by, or through, the Foreign Office, the Colonial Office, the India Office, or the Board of Trade, or through the Colonial or Indian Government Authorities. Requests for the examination of such materials may also be submitted by Public Commercial Bodies and Institutions of the respective Colonies and Dependencies, or by the Representatives of H.M. Government in foreign countries.

COMMERCIAL INTELLIGENCE DEPARTMENT.

The Office of this Department, in the West Corridor, First Floor, is open daily from 10 a.m. to 5 p.m. (on Saturdays till 1 p.m.), for the purpose of answering enquiries and supplying information relating to the Commerce (Export and Import) and Industries of India and the Colonies. Applications may be made personally or by letter. Special information may be obtained from the Curators in charge of the Indian and of certain Colonial Collections. Arrangements have been made for the translation for mercantile firms of Trade Circulars, Price-Lists, and Catalogues into any Foreign Language, including the conversion of weights, measures and coinages, etc., at cost price, and application for such may be addressed to this Department.

COMMERCIAL COLLECTIONS.

The Galleries containing the Colonial and Indian Collections, and the Public Commercial and Industrial News Room, are open for free inspection by the public daily, except Sundays, and any days specially notified, from 11 a.m. until 5 p.m. (on and after the 15th inst. until 7 p.m.). Every information concerning the products, their supply, etc., can be obtained on application to the Curators of the Indian and Ceylon, Canadian, and South African Sections, to the general Curator, and to the Commercial Intelligence Department.

CITY BRANCH OF THE IMPERIAL INSTITUTE.

REMOVAL TO 49, EASTCHEAP, E.C.

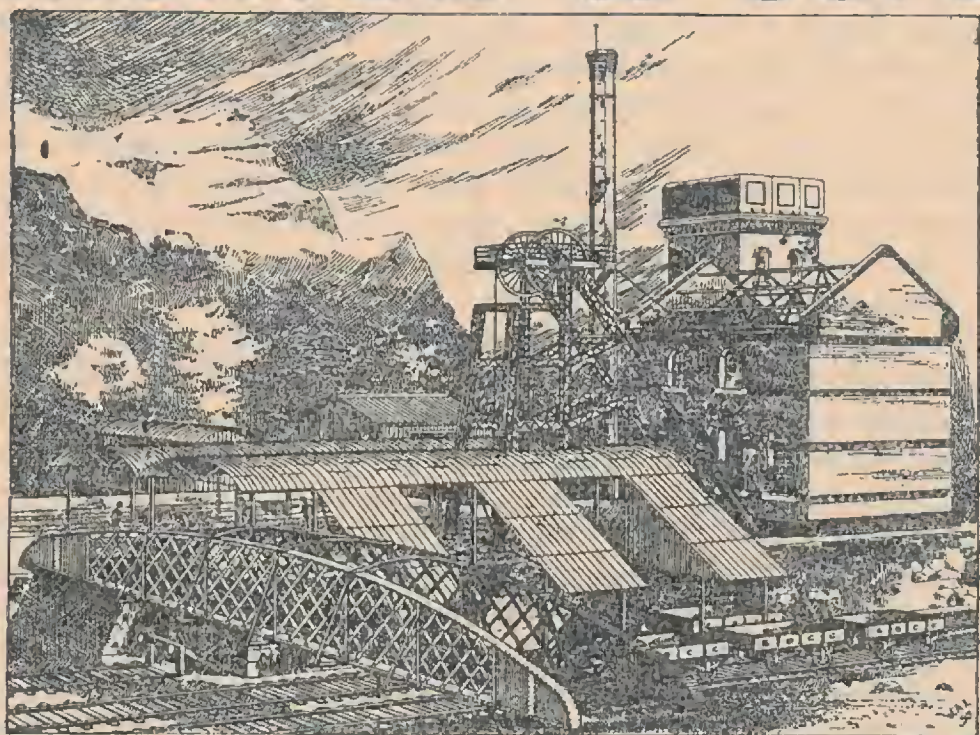
On and after May 1st, the City Enquiry Office and Reading Room will be removed from 112, Cannon-street to larger premises at 49, EASTCHEAP, where a commodious apartment will also be opened early this month for the display, to merchants, manufacturers, etc., of raw and manufactured products received, from time to time, from the Colonies and from India, and for which it is desired to find openings in British markets. Curators and other members of the Imperial Institute staff will attend at the Office, at stated times and by special appointment, to deal with enquiries and to assist in establishing or facilitating business relations with mercantile houses, etc., in the Colonies and India. The City Branch is in constant communication, by telephone and messengers, with the Imperial Institute, South Kensington. (For further information see page 132.)

THE NORTHBROOK SOCIETY.

The Northbrook Society is affiliated to the Imperial Institute, and has a special room allotted for the exclusive use of its members in the Institute buildings. Its primary objects are to watch over and promote the interests of natives of India, and to provide a system of guardianship or supervision over such as are sent to Europe for education. The Society is controlled by a committee consisting of an equal number of Governors of the Imperial Institute and members of the Society, presided over by the Earl of Northbrook. It possesses an excellent library. Indian members, who pay no subscription to the Society, have the especial advantage of becoming Fellows of the Institute at half the usual subscription payable by the ordinary Fellows. Applications for membership of the Society should be addressed to the Secretary of the Northbrook Society, Imperial Institute, London, S.W.

"REQUIREMENTS" REGISTRY.

With the object of affording Fellows of the Imperial Institute, and the General Public resident in the United Kingdom, an opportunity of making known special "wants" or "needs" in the British Colonies, India, and Foreign Countries, space will be regularly devoted to approved notices in a column reserved for this purpose. Advertisers may have their replies addressed to them direct, c/o the Imperial Institute, London, S.W., under a distinctive number and initials. The cost of postage will be charged for the transmission of replies delivered at the Institute. Residents in the Colonies and India, and Foreign Countries, can register in like manner. (For further particulars see page 130.)

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NOTICE.—For the early information and convenience of Shipowners, Captains, and others, ALL NEW ADMIRALTY CHARTS that may be published from time to time are noted every Monday in the *Shipping Gazette and Lloyd's List* on page 7; in the *Shipping Gazette and Lloyd's List Weekly Summary* every Friday, on page 1; and in the *Lloyd's Weekly Shipping Index* every Friday, on page 3 of Cover. The new and corrected Admiralty Charts are also noted in the following weekly and monthly journals:—*The Syren*, *The Nautical Magazine*, *The Geographical Journal*, *The Shipping World*, *The Mariner*, *THE IMPERIAL INSTITUTE JOURNAL*, and *The Steamship*, etc., etc.

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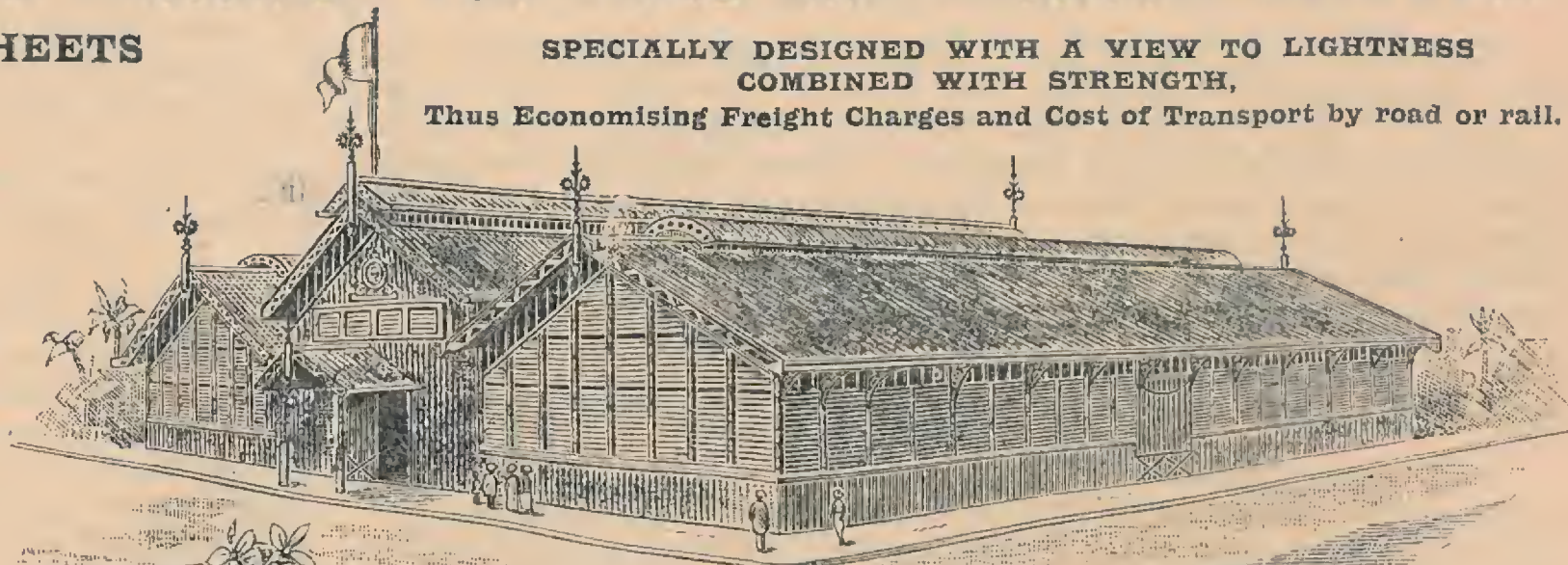
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FINANCIAL AND COMMERCIAL RETROSPECT.

UNITED KINGDOM.—In making his Budget statement on the 14th of last month, the Chancellor of the Exchequer said that for the year 1901-1902 the total issues from the Exchequer were £195,522,000; the original expenditure provided for in the Budget of that year was £184,212,000, but that amount had been swollen by supplementary estimates of £12,631,000, and an unexpected increase in the Consolidated Fund charges of £73,000, though, on the other hand, savings had been effected to the extent of £1,394,000. The estimated revenue was £142,455,000, but the actual receipts were greater by £543,000. The sugar tax yielded £1,290,000 more than was expected, and the coal duty brought in rather more than the estimate, and that with scarcely any effect on the exports, which were higher than ever they had been except in 1900-1901. The duties on wine, beer and spirits produced less than was allowed for, but the receipts from tea and income-tax were better than expected. The deficit was £52,524,000. This had been met out of the Consols loan, which yielded £56,553,000, leaving a balance of over £4,000,000. For the current year the Chancellor put the expenditure at £174,609,000, the main items being:—Consolidated Fund charges £29,450,000; Army estimates £69,665,000; Navy estimates £31,255,000; Civil Service estimates £26,448,000; Customs and Inland Revenue £3,039,000; and Postal service £14,752,000. The receipts, estimated on the basis of existing taxation, were £147,785,000, made up of Customs, £32,800,000; Excise, £32,700,000; Death duties, £13,200,000; Stamps, £8,200,000; Land-tax and House duty, £2,500,000; Income-tax, £36,600,000; Post-office, £14,800,000; Telegraphs, £3,630,000; Crown lands, £475,000; Suez canal, £880,000; and Miscellaneous, £2,000,000. The estimated deficit thus amounted to £26,824,000, increased by further war expenditure and help to sugar-growing colonies to a total of £45,500,000. To meet this, the Chancellor proposed to take £3,500,000 from the existing Exchequer balances, to get £4,500,000 by suspending the Sinking Fund, to raise £32,000,000 by a new loan, and to create new taxation, estimated to produce £5,150,000. The new taxes proposed are a duty of 3d. per cwt. on imported corn and 5d. per cwt. on imported flour, estimated to yield £2,650,000; an increase of 1d. on the income-tax, estimated to yield £2,000,000; and an additional penny stamp on cheques and dividend warrants, which it is hoped will yield £500,000. The duty on corn has met with general approval from almost all, except those whose business it is to oppose, as a step in the desirable direction of broadening taxation; the increased income tax has been received with submissiveness as being only what was to be expected from the wisdom which at present is at the head of the nation's finance; and the stamp duty is the only one of the three that has aroused much feeling, largely on the ground that it is futile to worry people with an impost which will bring in only a paltry amount, even if it is successful, as is not regarded as by any means certain in some competent quarters.

At first sight the trade returns for March appear very bad as compared with those for the same month of last year, for in both the imports and the exports there is a falling off of over 11 per cent., the imports at £40,897,861 being £5,528,195 less than in last year, while the exports at £22,217,238 are £2,804,055 to the worse. It must be remembered, however, that Easter falling in March this year diminished the time available for business by at least two days, while on the export side the amount received for new ships sold abroad was £2,167,225 less than last year. In the imports the decrease was generally distributed over the whole range of articles, and only a few of the total number showed an increase either in quantity or value. Among raw materials for textile industries there were some exceptions. Owing to larger shipments from Brazil and the United States, the quantity of raw cotton increased by 17.1 per cent., though its value was only 4.8 per cent. better. The value of cotton manufactures increased by 13.1 per cent. Wool, on the other hand, was less by 40,997,902 lb. (45.7 per cent.), and in value lost £1,376,388, or 47.8 per cent., owing to smaller receipts from Australia and New Zealand. In hemp there was a fall of 13.9 per cent. in amount, with a very small rise in value, and in jute there was a rise in both respects, 36.4 per cent. in quantity and 17.4 per cent. in value. In articles of food there was a fall of 1,306,100 cwt. in wheat, together with an almost exactly equivalent diminution of value, owing to a great reduction in the supply from the United States and Argentina. Wheat flour, owing to smaller shipments from the United States, was less by 33.5 per cent. in quantity, its value being 34.4 per cent. less. Oats, too, fell off, the reduction in amount being 41.4 per cent., and in value 27.1 per cent. The value of Indian corn was 9 per cent. smaller, but the reduction in quantity amounted to 22.3 per cent.; the United States sent only 201,200 cwt., against 3,904,000 cwt. in March last year; but Roumania sent 1,364,200 cwt. against 12,500 cwt., and Russia 1,030,300 cwt. against 63,300 cwt. The only one of the cereals for which higher figures were reported was barley, the quantity of which rose 26.2 per cent., owing to larger shipments from Roumania and the United States; its value was 24.1 per cent. higher. In sugar there was a large falling off. The refined article was £481,769 (32.6 per cent.) less in value, the quantity having diminished from 2,405,461 cwt. to 1,868,328 cwt., while raw sugar fell from 2,744,526 cwt. to 1,345,766 cwt. (63.7 per cent.) in quantity, and was

£869,501 (50.9 per cent.) less in value. In the exports coal was shipped to a slightly greater extent (2.2 per cent.), but the sum received for it was £305,582 smaller (12.7 per cent.). Iron and steel showed a substantial increase, the amount being higher by 34,037 tons, and the value by £208,825. Machinery, however, was less in value by 11.3 per cent. (£171,470), although locomotives slightly increased. Cotton piece-goods improved in quantity by 6.9 per cent., though their value was practically stationary; larger shipments to China accounted for 22,000,000 out of the total of 29,176,000 yards increase. Cotton yarn and twist increased by 6.3 per cent. in amount, but in value were 7.8 per cent. less, and other cotton manufactures were worth 3.2 per cent. less. Wool rose 60.8 per cent. in amount, and 55.4 per cent. in value; woollen and worsted yarn increased 2.7 per cent. in the former respect, but declined 7.9 per cent. in the latter, while woollen tissues were almost the same as in last year. Chemical manures were half as much again in quantity, and their value was 30.3 per cent. higher, while soda compounds, with a rise of 10.9 per cent. in amount, were enhanced 27.0 per cent. in value. The exports of foreign and colonial merchandise were valued at £4,314,471; last year they were worth £5,200,525, the decrease thus being £886,054.

COLONIES.—The gold output from the mines on the Witwatersrand which have so far re-started working was 104,127 oz. of fine gold in March. In the preceding month the total was 81,405 oz. Rhodesia in March yielded 16,891 oz., as compared with 14,289 oz. in the same month of last year. The Queensland output was 60,300 oz., and Victoria produced 66,058 oz. The gold exported from Western Australia and received at the Perth mint amounted to 177,505 oz., valued at £647,895, or 49,650 oz. more than in the same month of last year.

Lord Cromer's report on Egypt has recently been published. The main heads of the Egyptian financial position for 1901 were given in last number of this JOURNAL, but the report also deals, among many other topics, with the estimates for 1902. These show a surplus of £E210,000, but this, Lord Cromer thinks, will be considerable exceeded, even though for the first time the Government has to face the payment of the annuity due for the construction of the Nile reservoirs. This actually amounts to £E160,000, but since for every £1 added to the administrative expenditure £1 has to be paid over to the Caisse de la Dette, the expenditure in which the Government is really involved is £320,000. If Egypt were not hampered by the peculiar system of accounts and estimates imposed by its international obligations, the figures for 1902 would stand:—Revenue, £E10,844,000; expenditure, £E9,900,000; surplus, £E944,000. At the same time it is satisfactory to note that for some time past the most friendly relations have existed between the Government and the Caisse de la Dette, and while the Commissioners of the latter are of course bound by the provisions of the laws by which it is regulated, they have shown a general disposition to meet proposals of the Government in a friendly and conciliatory spirit. As regards the Soudan, the finance is in a more satisfactory condition than might have been expected, although it is not yet possible to balance the Budget without a relatively heavy deficit, amounting for 1902 to £2,268,000.

The following table shows the variations which have occurred in the securities of certain Colonial Governments during the past three months:—

	25th Feb.	26th Mar.	28th April.
Canada 3 per cent.	101 - 101½	101 - 101½	102½ - 103½
Cape 3 per cent.	96 - 96½	96½ - 97	97½ - 97½
Natal 3 per cent.	93 - 94	93½ - 94½	95 - 96
New S. Wales 3 per cent.	96½ - 97	95 - 95½	95½ - 96½
New Zealand 3 per cent.	95 - 95½	93½ - 94	95½ - 96
Queensland, 3 per cent.	94½ - 95½	95 - 95½	95½ - 96½
South Australia 3 per cent.	93½ - 94	94 - 94½	95 - 95½
Tasmania 3½ per cent.	103½ - 104½	103½ - 104½	103½ - 104½
Victoria 3 per cent.	96½ - 97	96½ - 97	97½ - 97½
West Australia 3 per cent.			
(May-Nov.)	93½ - 93½	93½ - 94½	93½ - 94½

INDIA.—The fluctuations which have been recorded in the securities of certain Indian railway companies during the last three months are shown in the following table:—

	26th Feb.	27th Mar.	29th April.
Bengal and North Western	131-135	130-134	130-134
Bengal-Nagpur Gua. 4 per cent.	103-107	103-107	104-108
Bombay, Baroda & Cent. India	157-163	156-161	158-163
Indian Midland 4 per cent.	103-107	103-107	104-108
Madras Grntd. 5 per cent.	133-137	132-136	132-136
South Indian 4½ per cent. Deb.	138-143	138-143	138-143
Southern Mahratta 3½ per cent.	106-109	106-109	106-109

FOREIGN COUNTRIES.—According to a provisional report issued by the Ministry of Finance, the Russian ordinary revenue for 1901 amounted to £197,852,160—that is, an increase of £7,541,600 as compared with the estimates, and an improvement of £10,397,970 over the figures for 1900. The ordinary expenditure in 1901, amounting to £171,789,750, exhibited an increase of £14,185,820 as compared with that of 1900. The extraordinary revenue was £18,004,470, and extraordinary expenditure £18,598,140.

According to the report of the International Financial Commission for the Greek Debt, the total amount received by the Commission in the twelve months from January, 1901 to January, 1902, reached the sum of 1,131,705 gold drachmæ and 58,041,476 paper drachmæ. In the same period the expenditure was 950,004 gold and 48,893,563 paper drachmæ, the balance thus being 181,700 gold and 9,147,913 paper drachmæ. The total paid in 1901 for the service of the debt was 15,036,669 fcs. The sums paid on the coupons reached 12,251,952 fcs., of which 6,087,662 fcs. went to England,

3,131,029 fcs. to France and 2,509,030 fcs. to Germany, while 524,229 fcs. were paid to the bondholders in Greece. To the amortization of the various foreign loans, 864,931 fcs. were applied.

According to the report of the American Iron and Steel Association, the total output of Bessemer Steel ingots in the United States in 1901 was 8,713,302 gross tons. This total is by far the highest in the history of American steel manufacture, being over two million tons ahead of that for the preceding year, and over one million tons greater than the figure reported for 1899. The production of Bessemer steel rails was the largest ever reached, amounting to 2,836,273 tons, of which over 2,200,000 tons consisted of rails weighing less than 85 lb. but more than 45 lb. per yard. The largest production of Bessemer steel rails in Great Britain was in 1882, when 1,235,785 tons were turned out—less than half America's output for last year.

Our usual table of exchanges follows:—

	25th Feb.	27th Mar.	28th April.
Paris, cheques	25f. 15½c.	25f. 17½c.	25f. 18c.
Berlin, sight	20m. 48pf.	20m. 46pf.	20m. 48½pf.
Vienna, sight	24kr. 00½h.	24kr. 01½h.	24kr. 01¼h.
Amsterdam, sight	12fl. 14½	12fl. 15	12fl. 13½
Madrid, sight	34ps.	34ps. 87	—
Lisbon, sight	408d.	41½d.	—
St. Petersburg, 3 months	94r. 05	94r. 05	—
Bombay, T.T.	1s. 4½d.	1s. 4d.	1s. 3½d.
Calcutta, T.T.	1s. 4½d.	1s. 4d.	1s. 3½d.
Hong Kong, T.T.	1s. 9½d.	1s. 9½d.	1s. 8½d.
Shanghai, T.T.	2s. 5½d.	2s. 5d.	2s. 3½d.

AGRICULTURAL RETROSPECT.

UNITED KINGDOM.—Until the middle of the month the weather of April was harsh and unseasonable, holding vegetation almost at a standstill. For the fruit trees this was no disadvantage while frosts were occurring every night, but the check to the green fodder crops was unwelcome and expensive to owners of live-stock, and especially to flockmasters. For the cultivation of the soil, however, the weather was highly favourable. The month closed with genial spring weather, refreshing rains having induced a notable rapidity of growth of crops and pastures. With regard to the re-imposition of the old duties on corn, the *Times* considers that it has occurred too late to exercise any influence upon the home acreages of our cereal crops. At any other date, however, it is doubtful if farmers would have been induced by so trivial an impost to increase the area of wheat, barley, or oats. The duty of 3d. per cwt. on imported grain is equivalent to 12·9d. per quarter in the case of wheat, beans and maize, 10·7d. per quarter on barley, and 8·4d. per quarter on oats. These values are for the Imperial quarter, that is 480 lb. of wheat, 400 lb. of barley, and 312 lb. of oats. The official weekly average prices of British corn are always quoted per Imperial quarter, and, as these prices vary sometimes in one week to a greater extent than the respective amounts representing the duty per quarter, it is hardly likely that corn-growing in this country will receive any stimulus. In replying to a question, the Chancellor of the Exchequer remarked that the British farmer can easily feed his stock with home-grown grain if he prefers it. Maize, or Indian corn, has been grown on a small scale in certain parts of England for several years, but lately British farmers seem to have given it an increased amount of attention, and the Board of Agriculture have now published a leaflet upon the subject. When grown as a green crop for fodder, maize does not demand a better climate than many districts of England are able to offer, while as regards soil requirements and expenses of cultivation it compares favourably with most of our fodder crops. In our southern and south-eastern counties, where a low rainfall, and frequently recurring periods of drought, make the growth of roots rather uncertain, maize offers the opportunity of securing a large bulk of succulent material, which may, to a considerable extent, replace the common fodder crops. The seed may be sown from the middle of May to the middle of June, but the earlier sowings are liable to injury from frost. The seed is planted to a depth of 2½ inches to 3 inches in rows not less than 16 inches apart. The quantity of seed used varies between 1½ and 2½ bushels per acre. When the young plants appear above ground horse- and hand-hoeing must be attended to, as in the case of other drilled crops; but when once fairly established, maize, being a rank-growing plant, reaching as it does a height of 5 feet or 6 feet, will largely suppress weeds by smothering them. As regards its employment, green maize is found to be very useful for scattering on bare pastures in August and September, where it is readily eaten by all kinds of stock, not excluding pigs. In America, and to some extent in this country, the main value of the crop is due to the opportunity it provides, through the agency of ensilage, of securing a supply of nutritious succulent material for use in the winter and spring months. The quality of the silage that maize produces is excelled by that of no other crop. If maize be utilized in this way it should stand till it is as mature as it is likely to become in this country, though it must be got off the fields before the occurrence of autumn frosts. A good sample of maize silage is of a greenish-brown colour, and emits an aroma almost indistinguishable from that of strong tobacco. It is much relished by stock, and seems to have a feeding value not inferior to that of mangel.

An outbreak of foot-and-mouth disease occurred at the end of March near Canterbury, after the country had been free from the disease for nearly

a year. This was a serious misfortune to flockmasters in a wide area round the infected district, owing to the severe regulations which are necessarily imposed with a view to the prompt suppression of the disease. In the *Journal of the Board of Agriculture* for March there is a useful article on "The Purchase of Artificial Manures." The various manures and their constituents are explained, and buyers are instructed in the valuation of different qualities, numerous examples being given. A buyer may sometimes be led into purchasing a manure through its nitrogen being expressed as sulphate of ammonia, or the content of potash may be made to look more attractive by being stated as sulphate of potash, though in an invoice the potash must be stated as such. The rules for approximately converting some of the terms by which the valuable constituents of various manures, as described by vendors, are given as follows: To convert nitrogen into terms of ammonia, multiply by 1·2; nitrogen into terms of sulphate of ammonia, multiply by 4·7; phosphoric acid into terms of phosphates, multiply by 2·2; potash into terms of sulphate of potash, multiply by 1·85; potash into terms of muriate of potash, multiply by 1·58.

COLONIES.—The development of cold storage systems is having a stimulating effect upon the exportation of certain classes of agricultural produce from CANADA. Improved cold storage on ocean liners has increased the export of butter from the port of Montreal alone, during the past three years, by upwards of 100 per cent. in quantity, with an increase in profit owing to the superiority of the quality of the product now landed in Britain, as compared with that under the older and less perfect cold storage system. Too much emphasis cannot be laid upon the necessity for owners of creameries to provide cold storage accommodation at them, to protect the butter in cold storage from the day after it is made; and the Canadian Minister of Agriculture has induced the Dominion Government to grant a bonus of 50 dollars for every creamery at which the owner will provide and keep in use a refrigerator-room according to specified plans and regulations. This bonus system, commenced in 1897, has been taken advantage of by the owners of about 500 creameries; and to the owners or lessees of creameries who have not hitherto obtained the bonus of 50 dollars the Dominion Government will grant a bonus of that amount per creamery if and when its owner provides and keeps in use a refrigerator-room according to the plans and regulations during the current year, and the further bonuses of 25 dollars each for 1903 and 1904 if and when the refrigerator-room has been kept in use according to the regulations during these two seasons. Thus the owner of a creamery who provides the necessary refrigerator-room and keeps it in use during the three years may receive altogether a bonus of 100 dollars. The cold storage system devised and directed by the Dominion Department of Agriculture has done much to expand Canadian commerce in food products. It has taken into account the various interests of the producers, the collecting buyers, the carriers or transportation companies, the distributing merchants, and the consumers. By preventing losses by deterioration in quality it has increased the profits of the dealers and augmented the wealth of the country. Cold storage in every phase has been tried and found effective; but as at first the volume of trade might not have been sufficient to induce business men to put up cold storage warehouses for the accommodation of products intended for export, a grant was offered to those who would provide cold storage buildings at central points, such grant being in the nature of a guarantee that the earnings from the cold storage business at these points would yield at least 5 per cent. on the cost of buildings and plant. The rates to be charged were, of course, to be satisfactory to the Department of Agriculture, and the grants from the Canadian Government were not to be called upon except to make up any deficiency between the net earnings and the sum of 5 per cent. on the cost as mentioned. Advantage was taken of this offer at Quebec only. That capital put into cold storage warehouses will prove a sound remunerative financial investment is not now open to doubt, for this system has passed far beyond the experimental stage, and outside the realm of probable failure.

The annual report of the Planters' Association of CEYLON gives the following particulars regarding some of the minor agricultural products of the island. The cacao crop of 1901 was the largest on record, namely, 47,471 cwt., and as a careful examination of the increase of acreage does not lead to the conclusion that this is to any appreciable extent caused by new land coming into bearing, it may be taken that the increase is due largely to the recovery of estates from the attacks of canker and other pests, and that, agriculturally, cacao is in a sounder position than it has been for some years. The area under cardamoms has been largely increased both in Ceylon and in India during the last two years. The exports from Ceylon in 1901 were the heaviest on record, 559,704 lb., compared with 537,455 lb. in 1900. In consequence of this increase of supply, prices have fallen considerably, and it is feared that if the production is much further increased the market will fall below remunerative prices. The exports of the products of the cocoanut palm—oil, copra, poonac (oilcake), desiccated cocoanut—show that there was no diminution in production, the quantity of desiccated cocoanut being the largest ever exported. Rubber cultivation is receiving more attention, planting is steadily increasing both in the low country and at moderate elevations. The yield and quality of Para rubber grown in the Kalutara district has been very satisfactory, some of it realising 4s. 2½d. a pound. Steps are being taken to import the seeds and plants of the best varieties of *Castilloa* into the island.

FOREIGN COUNTRIES.—According to the Buenos Ayres *Standard*, a communication from our Board of Agriculture has been received by the Argentine Government, expressing belief in the freedom of ARGENTINA from foot-and-mouth disease, and intimating that British ports will be opened to Argentine live stock in September or October, if no fresh outbreak of the disease occurs in the meantime, on condition that the law of the Republic is made to conform to that of the United Kingdom, excluding stock, carcasses, fodder, and certain other goods from all countries in which foot-and-mouth disease is believed to exist.

LABOUR RETROSPECT.

UNITED KINGDOM.—The improvement in the iron and steel trades has become more evident during the past month, and has compensated for the slackness still existing in certain other industries; so that the general state of employment is better than it has been at any time this year, and, moreover, compares not unfavourably with a twelvemonth ago. In the textile industry, the situation is not much better, but the building, furnishing, printing and leather trades all continue to improve; boot and shoe workers, however, are not well employed. It must be understood that these reports of improvement apply to the state of employment, and not to the wage rate. The dispute in the Stourbridge glass trade furnishes another example of the restrictive policy which trade unions are alleged to favour. The rupture took place on the question of promoting or appointing men to positions in the glass house. Under the system enforced by the men's society, a vacancy in a particular department had to be filled by a man from the ranks of the union, who had been brought up at this particular work, the masters being prohibited from promoting men from other departments. A system so discouraging to personal advancement has naturally been found injurious to the trade, and it is principally on this point that the masters are holding out for reform. Fortunately, there is little unfriendly feeling among the men towards their employers, the dispute being with the society itself. Messrs. Thos. Webb and Sons initiated the attempt to get rid of these restrictions, and have opened their factory with non-union labour. Other firms are following this example. Speaking recently in the Rhondda Valley, Mr. W. Abraham, M.P. (Mabon), who is recognised as one of the most thoughtful and level-headed of our labour organizers, gave an account of his recent investigations into labour matters in America. At one time, he said, he thought that working with machinery could not be to the advantage of the men he represented. He returned thoroughly cured of this prejudice. The capitalists of America would not put up with the second best of anything, and whenever new plant was invented they calculated the purchase cost to them and threw away machinery that would be used in England ten or fifteen years longer. There was no sentiment; every man was invited to ascend, and valued according to his efficiency and the wages he earned. They were strong trade unionists, and were allowed to bargain for their fellow-men with the capitalists as to the price of work, but no interference was tolerated as to the amount of work to be done. Every workman was free to do as much as he possibly could, and if he did more than an ordinary day's work he was paid a bonus.

COLONIES.—The Emigrants' Information Office have brought up to date their handbook of general information for intending settlers in the WEST INDIES, and the following is a summary of the latest and most important details:—Firstly, with regard to general openings, the sugar industry comes under consideration. This, however, requires capital and experience, and is mainly in the hands of large proprietors, most of whom have been long connected with the West Indies. All field labour, and nearly all artizan labour, is carried on by coloured workmen, who are better able than white labourers to work under a tropical sun. In BRITISH GUIANA and TRINIDAD there are occasional openings for the employment of young men as overseers on the sugar estates, at salaries of about £40 to £50 per annum with board and lodging. Such men are required to be fairly educated, and men of the farmer class are usually found to be most suitable. In no case, however, should any young man go out, except under regular engagement. There is also, occasionally, some opening for capable artizans and shop assistants, but they, too, will do well to obtain situations before going out. Persons possessing large capital will, no doubt, have the time and money to visit the West Indies and judge for themselves of their capabilities as a field for investment and a place of residence. Small capitalists with, say, £2,000 will find that these colonies offer a fair prospect of making a comfortable livelihood, but they should first work for a year or two with some planter to learn the methods of cultivation. The industries for which the islands are suited are the cultivation of fruits, such as bananas, plantains, coco-nuts (by the sea coast), limes, oranges, etc., for all of which there is an increasing market; and also tobacco, coffee, cocoa, arrowroot, indiarubber, fibre plants, spices, and in some islands (as in Jamaica) the raising of cattle, horses and mules. Intending settlers in JAMAICA would do well to communicate with the Secretary of the Institute of Jamaica, from whom can be obtained particulars of a scheme of articling pupils in farming and planting, which is intended for young men with some £2,000 or £3,000 capital, who wish to adopt an agricultural career. A settler with enough capital to combine cattle and sheep-farming with fruit and other cultivation, should do well. Properties of 200 to 1,000 acres, with house, etc., would cost from £500 to £3,000 and upwards. The outlook for fruit-growers has been considerably brightened since the starting of the direct line of steamers. Bananas yield enormous crops, and their cultivation requires less capital than most of the other crops, and is remunerative. Sugar has latterly fallen to a low position, the total value of the sugar-cane products exported during the last five years being little more than one-third of the value of bananas and oranges shipped to the United States. The causes of this depression of the sugar industry are not far to seek, and in so much as they are of local origin they are entirely remediable. There are, perhaps, four sites in Jamaica at the present time where the erection of central factories fed from a *clientèle* of contiguous estates would enable sugar to be produced at a greatly reduced cost, but on the whole the majority of sugar estates in Jamaica are of sufficient size, agriculturally, to stand on their own merits and to be capable of individual development. The sugar district of Vere is being provided with a system of irrigation. The Government chemist considers that a capitalist seeking an outlet for his money in Jamaica could find no investment so safe, certain and remunerative,

as a well-situated sugar estate managed on up-to-date lines, and with sufficient capital to work it economically. A labour trouble in LAGOS, says the Colonial Secretary, is that there are, unfortunately, few natives who take to agricultural work, and it is a deplorable fact that among the unemployed there are quite a large number of able-bodied men who, because they have been taught at school to write a few ungrammatical sentences in a fairly legible hand, consider it beneath their dignity to follow agricultural pursuits. The capacity of the country still remains undeveloped, and this class of native could, if properly trained, materially help to open up the country in this particular way. Applications for employment in the Secretariat as clerks in Government establishments are constantly being received, and it was recently suggested to a candidate that he should take up agricultural work. He was appointed a pupil on one of the model farms, but remained there only a few weeks. He resigned, stating as his reason for so doing that the work he had been given to do was far too hard and too degrading. There is great scarcity of labour in BLOEMFONTEIN, and numerous building operations cannot be commenced before the supply is improved. The proposal to utilize the Boer refugees as labourers seems likely to lead to difficulties, judging from a recent example. Four starving Dutchmen asked for charity from a philanthropic resident, who offered them a gardening job at 5s. a day each. On the first day he found the four Boers smoking under a hedge. They had hired two Kaffirs at 2s. 6d. a day to do the work for them. In JOHANNESBURG the carpenters and joiners have been out on strike, and many were able to obtain their demands, owing to the large amount of work waiting to be done.

FOREIGN COUNTRIES.—The question of the legal position of trades unions has been before the courts in the UNITED STATES, and the New York Court of Appeals has just given a ruling on the subject. According to this ruling, working men have the right to organize for the purpose of securing higher wages or shorter hours of labour, or otherwise improving their relations with their employers, and have the right to strike where their object is not to gratify malice or inflict injury upon others, but to secure better terms of employment for themselves. In course of the action which brought about this ruling, it appeared that the members of a steam-fitting association insisted that contractors should not employ the members of another association who worked for lower wages, and caused strikes which resulted in the displacement of those of whose rate of wages they complained. The association whose members were displaced secured an injunction restraining the first-mentioned association from striking or making threats to strike, but this action was reversed on an appeal, the appellate courts holding, in effect, that members of labour organizations need not work with other employees not members of their organizations, and may order a strike to enforce their demands. The Court of Appeals took the ground that the defendants had the right to strike for any reason they deemed a just one, and had the right to notify their employer of their purpose to strike. A labour organization, the Court said, is endowed with precisely the same legal right as an individual to threaten to do that which it may lawfully do. It is perhaps worthy of remark that the Court was far from unanimous on the question, the decision being reached by a majority of one. The State Labour Commissioner in his bulletin for the last quarter of 1901 says, that during that quarter only 4.6 per cent. of 97,270 members of labour organizations in New York State were idle, as compared with 8.5 per cent. for the same 188 unions in the corresponding period one year ago, when the idleness was less than it had been in any of the preceding years. Similarly the proportion of members idle at the end of December declined from 25.7 per cent. in 1900 to 19.1 per cent. 1901, the decreased idleness being particularly noticeable in the building, clothing and baking trades. At the end of January, 1902, there was a small decrease in employment in the building and furniture trades, which caused the average proportion of the unemployed in all trades and industries to rise to 20.9 per cent. In 1901, 47,585 members of labour unions obtained advances in wages, as compared with 2,068 who sustained losses. The average per capita weekly gain of the former was \$1.97 and loss of the latter \$2.67.

In ITALY a new Law on Emigration has come into force, and has introduced so many and important changes that it will mark an epoch in the annals of Italian emigration. The law establishes, first of all, a separate Government Commission to control emigration in all its branches, and to have a special care for the interest of the emigrant himself. An emigrant is defined to be a third-class passenger. Emigrants may start from three Italian ports only, Genoa, Naples, and Palermo, at each of which an inspector of emigration appointed by the Commission is stationed. Besides the ship's doctor who is appointed by the steamship company, each emigrant ship carries an Italian naval surgeon whose duties, besides the medical care of emigrants, are to ensure the proper carrying out of all the requirements of the law during the voyage. No persons may book or engage emigrants who have not obtained a licence from the Commissioners. Foreign steamship companies may become agents provided that they nominate an Italian subject or legally constituted Italian firm as their representative, and provided that they submit to all Italian laws and regulations as regards the actual operations of emigration. Public inducement to emigrate is prohibited, and no tickets may be issued without the production of a passport by the intending emigrant. The law contains numerous articles to protect the emigrant from imposition, to limit his responsibility in case of inability to sail after once booking his passage, to determine the indemnities to which he is entitled in case he does not obtain his passage, and further to specify how disputes between the agent and the passenger are to be settled. The agent has to pay a Government fee of 6s. 8d. per adult passenger, which goes to form an emigration fund to meet the expenses of the commission and the offices connected with it. In the countries to which Italian emigration is most specially directed, as, for instance, the United States, Brazil, and the Argentine Republic, the Government will arrange for the institution of offices for the protection and information of emigrants and establish a labour bureau with travelling inspectors. Another novel feature in the law is that the same protection is accorded to Italians returning to their own country as to those that are leaving it. This is an important matter, as the statistics show that the number of returning emigrants who have made money, is equal to the number of those who go out to seek their fortune.

Disturbances, originating with the Socialists, occurred in BELGIUM and resulted in a general strike in Brussels, followed by a rapid-extension of the

movement to the chief industrial centres, Charleroi, Liège, Verviers, and the coal district of Le Borinage. At one time some 200,000 men were estimated to have left their work throughout the country. Serious conflicts took place between the rioters and soldiery. On the 20th of the month, the Labour party adopted a resolution that work should be resumed. Unfortunately it is highly probable that the lull in this Socialistic movement is only temporary.

SCIENTIFIC AND TECHNICAL DEPARTMENT OF THE IMPERIAL INSTITUTE.

REPORT ON SPECIMENS OF EAST INDIAN WALNUT.

(By MR. HERBERT STONE, F.L.S., F.R.C.I.)

The following report of the examination of specimens of East Indian walnut has recently been made by Mr. HERBERT STONE, one of the Imperial Institute expert referees on timbers. In his report Mr. Stone says :—I have carefully examined and tried the sample slabs of *Albizia lebbek*, or East Indian walnut, otherwise known as “koko,” and am favourably impressed with the wood, as it is fully equal to the American black walnut (*Juglans nigra*) which is now so largely used in England, and I think it would compete on equal terms with that wood. It is certainly heavier and varies considerably, amongst the 13 specimens one or two being rather heavier than is desirable for a furniture wood. It possesses a good figure which runs curly at times, in which case the appearance is very fine, and though not possessing much lustre when straight-grained, it has a “watered” appearance when curly in the grain. Taking plain and choice specimens together it shows about the same range of figure as the above-mentioned American walnut.

I make my comparison with this wood, as it is the one whose place it must occupy, for I do not think it would compete with English or Italian walnut (*Juglans regia*). The mechanical tests I have applied are sawing, planeing, turning by power and polishing by hand. I find that it comes up to a better surface, with rather less trouble, than the American wood, and can be worked as fast and with the same ease. In finishing it requires less preparation by means of glass-paper, as the wood is denser, but as the grain is very coarse it requires much filling, and the pores are lined with a quantity of soft tissue which absorbs much polish and hence occupies much time. I consider that as good a finish can be obtained in about the same time as with the black walnut. I do not doubt that a market can be found for East Indian walnut in England, and I consider that ordinary straight grained sound boards and planks should be worth 2s. 6d. per cubic foot at London or Liverpool. Choice logs would probably fetch higher prices up to 4s. 6d. per cubic foot. It is as well to mention that until the wood becomes known on the English market remunerative prices should not be looked for. A new wood is nearly always imported for a time at a loss.

The specimens examined were :—

I. I. No.	Indian No.	Whence Received.	Remark.
5,526	2,914	Satara, Bombay	Rather a poor specimen, poor in colour and the hardest of the series. Works well.
5,525	2,913	Haveli, Poona	A good specimen although from a very small tree; very fair colour; works better than the average.
5,889	3,277	Surat, Bombay, marked “Maghrech Bilimore.”	Planes like American walnut and well. Poor in colour, streaky and of little value.
5,505	2,893	North Kanara, Bombay .	The best specimen, rather redder in colour, nice straight grain; works excellently. A fine piece of wood.
6,129	3,512	West Khandesh, Bombay	Works well, rather hard, good colour rather streaky, of a rather purplish cast.
5,504 A	2,892 A	South Arcot, Madras . .	Works well, rather streaky, moderately good only; hard.
5,504 B	2,892 B	Do. . . .	A fine piece of curly, figured wood, but heavy and the hardest of all; good colour.
5,506	2,894	Tellicherry, Madras . .	A fair specimen, but good and of fair colour. Works well.
6,127	3,509	Ganjam, Madras	A good plank of good colour, even grain, very heavy. Works well.
4,938	2,656	Tenasserim, Burma . . .	A poor plank of inferior colour, streaky; works well but with an unpleasant, sneeze-provoking dust.
6,275	4,789	Mandalay, Burma, marked “Dharwar.”	A poor specimen, rather light indifferent colour, works badly. Probably immature and a little tainted with decay.
4,937	2,655	Thayetmyo, Burma . . .	A good specimen of fair colour, coarse in the grain; works well.
6,126	3,508	Minbu, Burma	A quite useless plank, badly tainted, defective and of extremely bad colour. Works well notwithstanding.

THE PREVENTION OF “SMUT” IN OATS.

The disease known as “smut” in oats is very prevalent in the western districts of Ireland, where from 10 to 50 per cent. of the crop is not infrequently destroyed by it, and consequently an investigation has been carried out by Dr. T. Johnson, on behalf of the Congested Districts Board, with the object of finding a suitable remedy. The results of the work were recently communicated to the Royal Dublin Society, and the paper is reproduced in the *Journal* of the Department of Agriculture for Ireland (March, 1902).

The disease is caused by a fungus, *Ustilago avena*, which attacks the young oat plant, but whose presence is not revealed until the grains are being formed. The latter, in infected plants, become black owing to the formation of the dark-coloured spores of the fungus, and gradually the whole of the tissue of the grain is replaced by a loose mass of the spores, which are scattered by the wind, thus spreading the infection. Even when the grain is not completely destroyed it is rendered quite useless, either as food for man or beast, or for sowing purposes. It has been found, however, by previous workers that the oat plant is only liable to attack by the fungus when in the seedling condition, and that if it can be safely carried beyond this stage there is practically no further risk of infection. When infected oats are used for seed, however, the “smut” spores are present on the surface of the grains, and when germination takes place the hyphæ of the fungus penetrate the delicate tissue of the seedling oat and later bring about the destruction of the crop. It is important to notice, too, that the presence of even a few ears of smutted oats will contaminate a large stock and produce widespread damage to the

next crop. The treatment usually adopted in such cases is to soak the seed, before sowing, in some fungicide which will kill the adherent spores without affecting the vitality of the grain, and many methods for attaining this object have been suggested. But even when the whole of the adherent spores have been destroyed there is still left another possible source of infection. The soil of a field, which has borne a crop of smutted oats, will contain large numbers of the spores, and these sometimes retain their vitality for several years, besides being capable of germinating on the decaying organic matter present. If, therefore, grain which has been freed from “smut” spores by treatment with some fungicide be sown in ground containing spores left from a previous crop, there will still be considerable danger of infection, and, in order to reduce the chances of this to a minimum, at least three years should elapse between successive sowings of oats on the same field wherever smut is prevalent. A moist climate is very favourable to the fungus, and this may possibly account for the prevalence of the disease in the west of Ireland.

It was found on enquiry that in many of the badly affected districts in Ireland the seed used by the farmers was saved from year to year from their own crops, and that no attempt of any kind was made to prevent the recurrence of the disease. A quantity of infected grain was, therefore, procured from Co. Donegal, and, after tests to make sure that the oats were smutty, a series of experiments was instituted in order to determine the most suitable fungicide for use. The following table gives the particulars of the different methods tried :—

No.	Fungicide.	Strength of Solution.	Time of Immersion.
1	“Sar” or sodium sulphide solution	0·5 per cent., i.e., 1½ pints of sar in 50 gallons of water	24 hours
2	Potassium sulphide	0·5 per cent., i.e., 1½ lb. of the sulphide in 25 gallons of water	24 hours
3	Copper sulphate	0·5 per cent., i.e., 1 lb of the sulphate in 22 gallons of water	12–16 hrs.
4a	Formalin	0·2 per cent., i.e., 1 lb of formalin in 50 to 60 gallons of water	2 hours
4b	Formalin for 2 hours as 4a followed by ammonia	0·2 per cent., i.e., 1 oz of ammonia in 4½ gallons of water	15 min.
5	Hot water	132° F.	10 min.
6	Control	Not treated	

The first of these, the “sar” solution, has been strongly recommended as a fungicide by the United States Department of Agriculture, and its method of preparation is given in the paper. A stronger solution than that given in the table can be used, but in that case the time of immersion must be reduced; thus, when one gallon of “sar” is used to 50 gallons of water the seed is only soaked for two hours. This also applies to the use of the potassium sulphide solution (No. 2), in which case it was found that immersion for the shorter period in the stronger solution was quite as effective, did not lessen the germinative power, and the grains dried more quickly. The treatment by steeping in the copper sulphate solution proved too strong, as the seeds afterwards possessed a very low germinative power when tested in the incubator, and this was fully confirmed by the subsequent field experiments. This result agrees with American experience, and it is suggested that, if copper sulphate is used as a remedy for “smut,” the grain should not be steeped in the solution, but only sprayed with it and afterwards treated with lime. Treatment with formalin has been stated to lessen the germinative power of the oat, and for comparison some of the grain so treated was afterwards placed in a 0·2 per cent. solution of ammonia for 15 minutes, as recommended by David. The germination of both lots was then tested in the usual way, and found to be 99 per cent. in the case of treatment with formalin alone and 96 per cent. in that of formalin followed by ammonia. A very cheap and effective method of treating smutted oats is the one introduced by Jensen, in which the infected grain is immersed in water at 132° Fahrenheit for ten minutes, but this to be successful requires to be very carefully conducted. If the temperature is a few degrees too high or the steeping is continued too long the oats, as well as the spores of the fungus, will be killed, while, on the other hand, a temperature much below 132° Fahrenheit is not fatal to the spores. The method is, therefore, not so simple as the others, and could not be recommended for general adoption in the west of Ireland.

After treatment with these different fungicides samples of each of the six lots were sent to three districts in the west for a practical test and, in addition, small control experiments were conducted at the Royal Botanic Gardens, Glasnevin. The samples were sent out simply numbered, and no information was given regarding the treatment which they had undergone. In all cases the beneficial effect of treatment with a fungicide, except copper sulphate, was clearly proved, as will be seen from the results of the larger experiments given below, in which the numbers correspond to those of the previous table.

GRAIN.

Yield per Acre in lb.					Standard Smut-free Crop.
No.	Clifden (Co. Galway.)	Tourmakeady (Co. Mayo.)	Ardara (Co. Donegal.)	Average.	
1	1,650	1,370	2,240	1,750	1,600 to 3,200 lb. (40 to 80 bushels) per acre.
2	1,800	1,850	3,168	2,270	
3	1,380	1,250	1,872	1,500	
4	1,550 (b)	1,240 (a)	2,240 (a)	1,676	
5	1,920	2,000	2,080	2,000	
6	1,120	1,330	2,080	1,510	

STRAW.

1	3,840	1,720	4,432	3,330	2,800 to 5,040 lb. (25 to 45 cwt.) per acre.
2	4,160	2,090	5,760	4,000	
3	3,820	1,840	4,256	3,305	
4	3,680 (b)	1,610 (a)	4,432 (a)	3,240	
5	4,240	2,250	4,230	3,573	
6	3,040	2,150	4,430	3,206	

In each case the official in charge of the experiments reported that No. 6, which had not been treated in any way, was quite as badly affected with “smut” as the farmer’s ordinary crop, whereas very little disease developed in any of the treated samples, and at Tourmakeady No. 5, which had been treated with hot water, was quite free from “smut.” In addition the straw from No. 1 to 5 was of excellent quality, while that from No. 6 was very inferior and badly contaminated with smut spores.

These results were so satisfactory that it was decided to distribute some fungicide to the farmers themselves for trial, and for this purpose “sar” was chosen as being very effective and

at the same time cheaper and keeping better than potassium sulphide. In all, 55 separate tests were made in the counties of Galway, Mayo and Donegal, and in each case two plots were sown with smutted grain of the previous year, one after treatment with the fungicide, the other without such treatment, so that a direct comparison was possible. The results again proved most satisfactory; in every district but one the crop from the treated grain, was either entirely free from smut or was very much less affected than that from the untreated grain, which in many cases was so bad as to be useless. It was noticed, too, that the treatment with "sar" appeared to strengthen the plants and certainly hastened germination, so that the oats may be advantageously sown the same day they are soaked, after a few hours' drying. In one case it was found that grain soaked in a solution which had been previously used did not give such a good result as the first lot, but was better than that which had not been steeped at all. Only in the Westport district of Co. Mayo was "smut" plentiful on both the treated and untreated plots, and here the rotation of crops is simply oats and potatoes, so that land which carried oats in 1899 was again employed in 1901 for the same crop. If the grain used was effectively soaked the infection would appear to have come from the soil, and the necessity of allowing an interval of at three least years between the crops is emphasised.

These experiments conclusively prove that "smut" in oats, hitherto so prevalent in the west of Ireland, can be almost, if not entirely, prevented by a cheap and simple treatment of the seed oats with some fungicide, such as "sar" or potassium sulphide solution. The former appears to be the more convenient for general use, and in one day two men can treat enough oats to sow 20 acres, the cost of the solution required being only from 1/- to 1/6 per acre, whereas the yield may be increased to 40-80 bushels per acre instead of half these quantities. The farmers were greatly impressed by the success of the experiments, and there is every probability that the treatment will be widely adopted in the future.

THE EMPLOYMENT OF CATALYTIC METHODS IN CHEMICAL MANUFACTURES.

The term "catalysis" was first employed by the Swedish chemist Berzelius to describe a group of reactions in which some substance appeared to bring about a chemical change without itself undergoing any alteration. A familiar example of such a catalytic action is to be found in the operation of a certain form of automatic gas-lighting apparatus, consisting of a small plate or sponge of platinum, or asbestos coated with a thin layer of platinum black, and suspended just above the gas jet. When the latter is turned on the gas impinges on the platinum black or sponge, the latter becomes incandescent and so inflames the issuing gas. The platinum black in this instance of catalytic action enables the oxygen of the surrounding atmosphere to combine with the carbon and hydrogen of the coal-gas, *i.e.*, to burn the latter, but is itself quite unaltered and retains this property for unlimited periods, provided the platinum be raised to incandescence from time to time. At first it was supposed that reactions of this kind were comparatively rare, but recent investigations have shown that catalysis plays a very important part in bringing about chemical changes, and attention has thereby been directed to this subject both from the technical and scientific sides. Professor Ostwald, of Leipzig University, has recently, in an address delivered to an assembly of medical men and naturalists at Hamburg, discussed the various explanations which have been offered as accounting for obscure reactions of this nature, and has shown that, in general, catalysis is merely produced by a great increase in the velocity of a reaction already proceeding; *i.e.*, in the example already given, the gas would be slowly oxidised by the oxygen of the atmosphere alone, but the presence of the platinum black induces a great increase in the rate of this oxidation and so causes the lighting-up of the plate and the inflammation of the gas. Ostwald, therefore, defines catalytic actions as those changes brought about by agents capable of affecting the velocity of chemical reactions without themselves appearing in the final products. These agents are conveniently termed catalysts. Accepting this definition it will be seen that a very large number of chemical reactions are included under this heading; thus, the changes brought about by enzymes or unorganized ferments, such as the conversion of starch into sugar, which occurs in the malting of barley, the conversion of food stuffs into soluble peptones and amides by the agency of pepsin and trypsin in animal metabolism, and the fermentation of sugar solutions by the enzymes of yeast with the formation of alcohol, are all examples of catalysis. Similarly a large number of reactions are known in which minute quantities of water and mineral acids are necessary agents: thus, the conversion of starch into glucose is carried on, on an enormous scale, in the United States and is generally brought about by boiling the starch with an infinitely small amount of mineral acid, the latter undergoing no change in condition or quantity during the process. During the last few years it has been shown that many chemicals which readily react with each other in a moist condition, are inactive when perfectly dry; thus, mixtures of oxygen and hydrogen are not explosive when thoroughly dried, but the introduction of a mere trace of moisture into the mixture restores this property. In these cases the small quantities of water, mineral acids and enzymes are to be regarded as true catalysts.

Turning to the industrial applications of this property an excellent *resumé* of technical catalytic actions is contained in a lecture recently given by Dr. Conroy to the Liverpool section of the Society of Chemical Industry and printed in the current number of the Society's *Journal* (March 15, 1902), and from this source the following abstract has been compiled:—

SULPHURIC ACID.

The material employed as a source of sulphur for the manufacture of this acid is iron pyrites which, when burned in an unlimited supply of air, furnishes sulphur dioxide, and the latter by further oxidation yields sulphur trioxide, which when dissolved in water constitutes sulphuric acid. The most difficult step in this series of operations is the oxidation of the sulphur dioxide, and this is brought about at the present time in most vitriol works by the combined action of nitric oxide and atmospheric air in large specially constructed leaden chambers. In this process the first material obtained is a weak, impure sulphuric acid, which requires to be concentrated before it can be sent into commerce. During the last few years processes have been elaborated in Germany for the oxidation of sulphur dioxide, produced from burning pyrites, with the aid of platinum black and similar catalysts. It has long been known that by passing mixtures of sulphur dioxide and atmospheric air over asbestos coated with platinum black, sulphuric acid could be obtained, and this is the principle underlying the new process, but much investigation has been necessary in order to secure satisfactory working on the industrial scale. It was found that the efficacy of the platinum was rapidly reduced by impurities in the mixed gases passing from the pyrite burners, and so it was necessary to purify these from arsenic and other substances by passing them through a system of cooled pipes and eventually through concentrated sulphuric acid, before bringing them into contact with the heated platinum. The latter is generally employed in the form of platinised asbestos, but other forms have also been used, such as pumice stone impregnated with platinum-black, etc. The temperature at which the platinum must be maintained is also an important matter, since this greatly affects the yield of acid obtained; the limits appear to lie at 200° C. and 1,000° C., the best temperature being from 400° to 500° C.

In spite of the many difficulties experienced in working this process it appears to be efficient and cheap, since one of the most important chemical firms in Germany has abandoned the lead chamber process in favour of this method, and now converts about 80,000 tons of iron pyrites into sulphuric acid per annum by its aid.

CHLORINE AND CHLORINE PRODUCTS.

The most important catalytic method of obtaining chlorine is the long-established Deacon process, which depends upon the decomposition of hydrochloric acid into chlorine in presence of cuprous chloride and atmospheric air at a temperature of 450°-500° C. This process, however, depends upon the Leblanc process of soda manufacture, in which hydrochloric acid is obtained as a bye-product, and since this method of alkali manufacture is now gradually being replaced by electrolytic methods in which chlorine itself is a product, the importance of the Deacon process is likely to decline in the future. As an adjunct to the electrolytic process for the decomposition of sodium chloride into caustic soda and chlorine, there will probably arise in the future a necessity for a method of converting chlorine into hydrochloric acid; several patents for this purpose have already been taken out, but so far none of these have been successfully worked. Pataky (Eng. Patent 1900, 1831) has proposed to reverse the Deacon process by passing chlorine and hydrogen over charcoal heated by means of a water bath, and Lorenz (Eng. Patent 1894, 25,073) has found that the interaction of chlorine, carbon and super-heated steam gives, under certain prescribed conditions, a satisfactory yield of hydrochloric acid, whilst at a French electrolytic soda works, part of the chlorine is stated to be converted into the acid by burning a jet of hydrogen in it.

An account of the development of methods for the electrolytic production of chlorates has already been given in this *JOURNAL*, Vol. VII., p. 96, but it may be pointed out here that it has recently been observed by Imhoff that the yield of chlorate obtained by direct electrolysis of chlorides is greatly increased by adding to the bath a small quantity of a soluble chromate, thus the yield of potassium chlorate for the same current employed in a 30 per cent. solution of potassium chloride can be increased from 32 to 69 per cent. by the addition of 18 per cent. of potassium chromate.

So far no salt but the chromate has been found to produce this effect, the corresponding manganese salts having no influence, whilst, curiously enough, cobalt salts prevent the formation of chlorate entirely.

FORMALDEHYDE.

This substance has during recent years come into extensive use as a disinfectant, and is commonly produced by means of the so-called formaldehyde lamps. The latter depend for their efficacy on the production of methyl alcohol vapour, which issues from a fine jet and impinges upon a small sponge of platinum black, which is at first slightly heated in order to start the action. Once started, the oxidation of the spirit to formaldehyde proceeds automatically, the heat of the reaction maintaining the platinum at a sufficiently high temperature to effect the change.

This method has also been applied to the production of other organic substances, but not on a large scale; thus, Trillat has obtained vanillin, the odorous principle of vanilla beans, from isoeugenol by this means, whilst Ipatiew, by a somewhat similar method, has prepared benzaldehyde, acetone and other substances from the corresponding alcohols.

CARBON TETRACHLORIDE.

This material is of considerable importance in the arts as a solvent of rubber, gutta-percha and similar substances and, unlike most solvents of these bodies, is not highly inflammable.

It is usually prepared by the action of chlorine on carbon bisulphide, but at ordinary temperatures practically no action occurs between these substances, except in the presence of certain catalytic agents of which iodine, antimony and aluminium chlorides, bromine, and even finely divided iron, have been successfully employed on the large scale.

In addition to the organic compounds already mentioned as produced by catalytic methods, attention may be drawn to the oxidation of naphthalene to phthalic acid by means of hot sulphuric acid, which forms the first step in the complicated process by which synthetic indigo is made. This reaction only proceeds easily in presence of metallic mercury or one of its salts. A similar influence of mercury in a reaction of this kind has been recorded by Rosenthal (German patent 127) in his investigation of the oxidation products of aromatic amines.

Many of these reactions are at present inexplicable, but it is very probable that they are to be accounted for by the alternate formation and decomposition of compounds between the catalyst and the substance undergoing change. The utility of platinum and palladium in such actions is no doubt associated with the property possessed by these metals of occluding oxygen, hydrogen, and other gases, the latter appearing to be more active in the "occluded" condition than in the free state.

NATURAL GAS IN ONTARIO.

The first search for natural gas in Ontario was made in 1888 by the Ontario Natural Gas Company, and a well was put down near Ruthven, which struck gas at a depth of 1,020 feet in the upper bed of the Guelph formation, and the yield at the commencement was a little more than 10 million cubic feet of gas per day. After the well was tubed and the gas shut in, it registered a rock pressure of 460 lb. to the square inch. This well opened up the Essex County gas field, now supplying gas to the cities of Windsor, Detroit and Toledo. The second well, drilled in the following year, opened up an entirely new field in the County of Welland, seven miles from east of Port Colborne. This was opened with a view to supplying the city of Buffalo, and the gas was struck in a white sandstone of the Medina formation at 836 feet from the surface. The flow from the well at its mouth measured 1,700,000 cubic feet per day, with a rock pressure of 525 lb. per square inch. 142 wells have since been drilled in this field at a total expense of \$703,000, and the gas has supplied Fort Erie, Bridgeburg and Buffalo.

The following table shows the strata passed through in the first gas well of the Essex field, which was called the Coste Well:—

Formation.	Strata.	Thickness.	Depth.	—
Onondaga	Soil	5 feet to	5 feet to	
	Drift, grey sand	115 feet	120 feet	
	Brown and grey dolomitic limestones with gypsum and flints	380 feet to	500 feet	
Do.	Grey blue, shaly and drab dolomites with gypsum	360 feet	860 feet	
Do.	Dark brown dolomites and gypsum	160 feet	1,020 feet	
Guelph	Grey blue crystalline vesicular dolomite	11 feet	1,031 feet	

The principal features revealed by this and other sections are that in the south and south-east part of the county of Essex, along Lake Erie, the first formation met with under the sand drift is the Onondaga and that a fault runs in a direction N.N.W. to E.S.E., passing a little north of the Coste Well, where the dip of the strata is 80° to the horizon. An extensive bed of gypsum 10 to 20 feet thick is found in the lower part of the formation; oil has not been found in payable quantity.

The formations occurring in the Welland County field are given in the following table :—

Formation.	Strata.	Thickness.	Depth.	—
Corniferous	Soil	2 feet	2 feet	
	Dark grey limestone. .	23 feet	25 feet	
Onondaga	Grey and drab dolomites, black shales and gypsum	390 feet	415 feet	
Guelph and Niagara	Grey dolomites	240 feet	655 feet	
Niagara Shales.	Blue Shales	50 feet	705 feet	
Clinton	White crystalline lime- stone, shaly towards bottom	30 feet	735 feet	
Medina	Red, blue and white sand- stones	98 feet	833 feet	
Do.	White sandstone	13 feet	846 feet	Gas at 836 ft.

In another well gas was not obtained from the Medina formation, but from the Trenton at a depth of 2,940 feet. The strata dip uniformly to the south and south-east at about 35 feet to the mile. Salt water is found in large quantities towards the middle of the Guelph and Niagara formation. According to the view of Mr. Eugene Coste the origin of this natural gas and petroleum is volcanic and not organic, and he states that he located the only two fields found in Ontario by mapping out the probable continuation of those fissured and fractured zones of the gas and oil fields of the United States, and he considers that the fact that the occurrence of gas is not confined to certain strata another proof in favour of the volcanic theory, these porous strata being simply reservoirs into which emanations of gases and petroleum from below are poured. The strata of the Ontario fields belong to the Silurian system, those of the United States to the Lower Carboniferous or older formations, and the decomposition of organic remains of the Cambrian and Lower Silurian ages is quite inadequate to explain the production of the enormous quantities of petroleum and natural gas found, for instance, in the Trenton or Lower Silurian limestone of Ohio and Indiana. What is considered a direct proof of volcanic origin is the fact that pressure is always greater in the older formations, showing that it is reduced by the friction caused in passing through the small fissures and pores of the rocks. The existence of the fields on the volcanic theory is explained as follows : That volcanic action is, and has been through all geological ages, shifting and intermittent along the fractured zones of the earth's crust, and it is well known that these deposits are localized and accidental, as for instance in the state of Ohio, where so many wells have been drilled all over the State, it is only in a very limited area in the N.W. part that 200 million barrels of oil and enormous quantities of gas have been produced during the last twelve years ; yet in many other counties of the State the same fossiliferous strata have been proved to be barren of hydro-carbon products. A final argument in favour of the volcanic theory is the analogy between the products of well-known volcanic emanations, such as fumaroles, solfataras, which consist largely of alkaline chlorides, hydrogen sulphide and hydro carbons, and those of different gas and oil fields. In association with the gas and oil there is found a bitter, salt water which is very often sulphurous. Sulphur also occurs in some of the oils and often in the natural gas as hydrogen sulphide. That of the Guelph dolomite of Point Abino, Welland County, has the following composition :—

Hydrogen sulphide	74 per cent.
Nitrogen	2.69 „
Hydrocarbons of the paraffin series	96.57 „
	100.00

The evidence appears conclusive that these mineral forms of carbon have been brought in their deposits, as most minerals have, under the influence of volcanic action.

COTTON CULTIVATION IN TOGOLAND.

Attention has already been directed in this JOURNAL to the increasing interest in the exploitation of its colonies now shown in Germany, and some account of the various exploring expeditions organised by the German Colonial Economic Committee to improve the cultivation of various products, and to introduce new staples into their colonial possessions, has been given (IMP. INST. JOURN., Vol. VIII. p. 98). Among these expeditions is one having for its object the extension of cotton cultivation in Togoland, of which a report on the work accomplished during the first year has now appeared as a special supplement to the *Tropenpflanzer* for March, 1902. At the present time the cotton-spinning industry of Germany depends for its supplies of raw material principally upon the United States of America, the imports from India and Egypt being comparatively insignificant, and this state of things is, in the opinion of German cotton-spinners, unsatisfactory, since the industry is always at the mercy of a foreign Government. The German Colonial Committee in 1900 therefore proceeded to organize an expedition to proceed to Togoland, which was the most promising of the German colonies for the purpose, and carry out there a series of experiments on cotton cultivation. The money necessary for equipment and maintenance was obtained in the form of subscription from firms interested in the German cotton trade and in the development of the colony, but principally by means of a lottery promoted by the German Colonial Company.

The leader of the expedition was Mr. James Galloway, formerly director of the cotton planting school of the Tuskegee Industrial Institute of Alabama, and he took with him several graduates of this Institute who had had experience of cotton-farming in the United States.

The expedition left Hamburg on November 21, 1900, and reached Lome, the capital of Togoland, on December 30 of that year, and immediately proceeded into the interior to select a suitable place for the experimental plantation, which was ultimately stationed at Tove-Djibe. About 100 acres of land were cleared with the help of natives, and attempts were made to plough the land in the usual manner, but great difficulty was experienced in maintaining horses and cattle owing to the ravages of the Tsetse fly.

Cotton seed brought from the United States was planted at intervals of about a month from March to June, and grew on the whole very well. From June to August various sorts of native, American and Egyptian cotton were planted, for purposes of comparison. The climatic conditions up to July were satisfactory, but at that time heavy rains followed by fogs were experienced until November, when the weather improved considerably, and ultimately good crops were obtained from the plots sown in the late summer.

Difficulties were also experienced in operating the gins for the extraction of the fibre, but eventually a power of the kind formerly used in Alabama was constructed and worked by 24 natives in place of the usual 2 horses. Next year it is proposed to import a 10 horse-power locomobile to do this work. Altogether 23 bales of cotton were prepared, 13 from native seed, 9 from American, and 1 from Egyptian seed.

The experiments have, of course, been in operation for too short a time to permit of conclusive results being obtained from them, but the report states that there is every prospect of cotton cultivation proving a successful industry in the colony, provided proper railway

and market facilities are secured and the cultivation be carried on by modern methods. The chief recommendations offered by Mr. Galloway are that attempts be made to improve the hardier and better qualities of native cotton by crossing these with American plants. The former yield on an average rather less than 28 per cent. of fibre from each pod, whilst in America the yield is generally 33½ per cent., but apparently the native cotton is of better quality than can be raised from American seed in the colony. It is also suggested that a railway should be laid, connecting up the best centres for cotton plantations, that good roads should be made, and markets opened at various townships. The cost of cotton exported from the colony to Bremen is, on the present method of working, calculated to be £12. 15s. per bale of 500 lb., but with the introduction of steam power to work the gins and oil presses, this price would be reduced to £10. 5s. per bale, whilst if the productiveness of the cotton plant can be increased to 33½ per cent. of the seed cotton the price can be reduced still further to £9. 10s. These latter values, if they can be realised, compare very favourably with the average price paid in Germany for cotton at present, which is about £11. 5s. per bale.

Specimens of the cotton obtained in these experiments have been submitted for valuation to the Bremen Cotton Exchange, with the result that the native cotton was valued at £9. 10s. per bale, whilst that raised from American and Egyptian seed was appraised at from 15 to 25 per cent. less, *i.e.* the cotton under present conditions is raised at a loss of at least £3. 5s. per bale. The experiments are, however, regarded as so satisfactory that an expedition has been fitted out to survey the colony, for the railway recommended by the cotton experts, the funds having been raised in the manner already described for the cotton expedition, whilst inducements are being offered to cotton farmers from Texas and Alabama to emigrate to Togoland.

A number of English planters in the neighbouring colony of Lagos, following the example of the Germans, have also taken up cotton cultivation on a large scale, but so far no information as to their success or failure is available, but it is principally to secure advantageous competition with this source that the railway through Togoland is being so strongly advocated in Germany.

IMPROVEMENT OF AGRICULTURE IN INDIA.

The Provincial Governments of India have in recent years made great efforts to induce the native farmers to modernise their methods, and, with this end in view, have established experiment stations and schools of agriculture at convenient centres, where field experiments are carried on and students are initiated into the application of scientific methods to agricultural work. These efforts, however, do not so far appear to have met with the success they deserved, and in the North-Western Provinces it has been considered necessary to re-organize to some extent the work of the Agricultural Department and to establish a closer connection between it and the Court of Wards, whose officials control much of the agricultural work in these provinces. As one result of this concentration, it has been found, in the opinion of Mr. Moreland, Director of Land Records and Agriculture of the North-Western Provinces and Oudh, that much of the experimental work has been of too spasmodic a character to impress the native cultivator, who, at once conservative and poverty-stricken, is backward in imbibing new ideas, and loth to incur expenditure in applying them. The Director has now issued a pamphlet calling the attention of landowners to the help which they can give the Department in this work, and discussing *seriatim* the best methods of organizing schemes for agricultural improvement in the districts in which they possess influence with the native farmers. The gist of the Director's suggestions on these various matters is given in the following paragraphs.

THE INTRODUCTION OF NEW CROPS.

The improvement in quality of the various crops raised in the provinces, it is suggested, could be best brought about by the landowner or his manager growing special varieties at his own expense and submitting these to the inspection of farmers on the estates, who should then be induced, if possible, to undertake experiments with the new crops on their own ground, seed being supplied to them at a rate somewhat below the market value. A list of crops suitable for such experiments in the North-Western Provinces is given in the pamphlet, and includes such varieties as the

Muzaffarnagar White Wheat, which has established for itself a reputation for fertility and drought- and rust-resisting qualities in Egypt and Australia.

Oats.—Certain varieties imported from Canada and the Cape are recommended for cultivation in horse-breeding districts.

Maize.—The Jaunpur variety is recommended in preference to any of those imported from America, since the latter have so far not done well in India.

Juar (Great Millet).—Experiments with several varieties of this plant are now in progress, but at present it is impossible to recommend one in preference to another.

Among other plants suggested for cultivation, but with which great care must be exercised, as they require more skilful management than is usually available in India, are potatoes, tobacco, and sugar cane. Experiments are also being undertaken by the Department on the cultivation of the Egyptian long-staple cotton, and it is now ready to advise cultivators with regard to this plant.

AGRICULTURAL IMPLEMENTS.

The substitution of modern implements for the crude apparatus now employed by the natives would do much to improve the position of the farmer in India. The Cawnpore experimental station is endeavouring to bring such a change about by lending, for demonstration purposes, various machines, but the Director believes that more good would result from this work if competent men were in all cases sent with the implements in order to ensure the satisfactory working of the latter when brought under the notice of the farmers. Among the machinery to which special attention is directed are ploughs and water lifts, chain pumps, and self-emptying buckets, the three last being very important improvements in a country like India, where artificial irrigation is necessary.

UTILIZATION OF WASTE LANDS.

The waste land in India may be divided into three classes : *usar*, or alkali land, ravines, and *bhur* or sandy land. The utilization of soil impregnated with alkali has been attempted with some success in the United States and in India. At the present time experiments are being carried out in the latter country on the cultivation of the "babul" tree, which affords good timber and a tanning material, on these alkali soils, but so far no definite results are available. The Agricultural Department is prepared to examine and give advice regarding the reclamation of such lands.

With regard to ravines, a short description of the silt-trapping method of dividing up the ravine by the gradually accumulating silt carried down by the river is given, as well as of the method of terrace cultivation, which is the more satisfactory, but requires the outlay of a considerable amount of capital.

The gradual utilization of *bhur*, or sandy soil, can only be successfully undertaken where a plentiful supply of organic manure is available, such as the drainage from a village. In certain districts in Oudh, excellent results have already been secured from waste land of this description by the application to it over considerable periods of such refuse matter.

Attention is also drawn in the pamphlet to the utilization of refuse of all kinds as manure, and many cheap sources at present wasted are pointed out. The importance of securing better breeds of horses, mules, and cattle is also dealt with, from which it appears that the native farmer has not so far attempted selective breeding with the object of improving his stock.

The organization of central markets, the combination of farmers to construct roads, bridges, and other works benefiting the whole agricultural community, the formation of banks, the arrangement of local credit systems, supply of seed, and other matters are also fully dealt with, and in most cases instances of successful application of the methods recommended are given, so that there is every inducement for landowners and farmers to benefit by the wide experience which the Agricultural Department thus places at their service.

GENERAL NOTES.

SUGGESTIONS FOR THE PREVENTION OF MALARIA.

At the recent Malarial Conference held in Nagpur, an interesting paper was read by Captain G. T. Birdwood, comparing and summing up the methods, in use and suggested, for the prevention of malaria in India. He condemns the carrying out on a large scale of such expensive schemes as the quininising of the whole population, or the wholesale adoption of mosquito nets by the inhabitants; but advocates a thorough reform of sanitary matters, managed in such a way as not to run counter to native prejudices. He attributes the spread of malaria in many districts to the haphazard excavation of the earth; the holes thus formed become filled with stagnant water and a fruitful breeding place for the anopheles. Ponds are often dug to obtain earth for the repair of railway embankments and roads and for use in brickfields, and it is invariably noticed that in the presence of these the fever mortality of the locality is increased. To check this source of infection, he recommends that cantonment authorities should send a special health officer periodically to see that excavations of that nature are promptly filled in. A point that Captain Birdwood considers most important of all is the universal adoption of *pucca* surface drains in place of *kutcha* drains, the most frequent breeding places of anopheles mosquitoes in municipalities and cantonments being the accumulated water in *kutcha* surface drains and roadside ditches, and again it is important that municipal water schemes should adequately provide for carrying away the waste water from wells and hydrants. As well as the use by cantonment authorities of *pucca* masonry for canals, ditches, etc., owners of private gardens should be compelled to use it for their irrigation channels and drains.

He thinks the employment of bands of coolies for systematic cleansing purposes in Indian towns is not desirable, since there is always the danger of interfering with native domestic concerns and customs: although such mosquito brigades, as they are called, have proved successful in Sierra Leone, and other West African towns. Another source of trouble is the overcrowding of servants in the *kutcha* houses attached to European compounds, and a bye-law should be passed to deal with it. Although, as mentioned previously, the extensive use of gauze nets, etc. is deprecated, Captain Birdwood advocates the adoption of mosquito curtains in the soldiers' barracks throughout the infected districts, also the use of fumigating and bactericidal agents, such as sulphurous acid, in dealing with coolie sheds and workmen's quarters. It is now generally accepted that quinine is of no value when given in small doses, but highly valuable as a prophylactic agent in large quantities: he considers therefore that municipal authorities should encourage the use of quinine as suggested by Professor Koch (this JOURNAL February, 1902, p. 44). Finally the education of many of the advanced native scholars, on the subject of malaria, would go far to assist the carrying out of suggested schemes, such as improved sanitation, which is very much wanted, by teaching the people to associate the malarial fever with the presence of mosquitoes and stagnant pools of water, and their co-operation in schemes of sanitary and other reforms could then be expected.

HYDROGEN PEROXIDE AS A BLEACHING AGENT.

The bleaching of such organic substances as feathers, silk and ivory presents considerable difficulty, owing to the ease with which these materials are destroyed by the action of such agents as chlorine and sulphur dioxide commonly employed for this purpose. The latter has also the further disadvantage that it merely combines with the objectionable natural colouring matter to form unstable colourless compounds which are liable to decompose in the presence of moisture, giving off the malodorous sulphur dioxide and restoring the colour to the material. This is often observed in straw hats bleached by sulphur dioxide which, owing to the action of perspiration and the moisture of the atmosphere, slowly revert to the natural yellow colour of straw.

During the last few years hydrogen peroxide has been used to a considerable extent as a bleaching agent, for delicate organic materials of this class, and appears to answer this purpose well, since it has, practically, no action on these materials, whilst it destroys their colours. It is, however, somewhat more expensive than sulphur dioxide, and although many attempts have been made to cheapen its production, no marked success in this direction has yet been achieved. Mr. Fawsitt, F.R.S.E., in a paper read at a meeting of the Glasgow section of the Society of Chemical Industry, (Feb. 28, 1902) described a method which he has found to give good results in practice, and which consists in dissolving barium peroxide in ice-cold hydrochloric acid, the barium being subsequently removed by adding sufficient dilute sulphuric acid. The paper gives in addition details of the best methods of preserving hydrogen peroxide solution and of employing it for bleaching silk, wool, feathers, bone, ivory and straw, the processes described being those which have been found to answer well in actual practice. This chemical has also been recommended as an antiseptic, especially by the late Sir B. W. Richardson, but has not been much used in this way, owing apparently to the acid-impurities present in the solutions sold in commerce. Mr. Fawsitt has attempted to prepare solutions of hydrogen peroxide free from acids and other impurities by distillation and by purification with silver sulphate, but has so far only succeeded in slightly reducing the irritating character of these, but not in eliminating them entirely.

THE ACTION OF SUNLIGHT ON DYED LEATHERS.

A series of experiments was carried out at the Gardens of the Royal Botanical Society, Regent's Park, during 1900-1901, by Mr. C. Lamb, with the object of ascertaining the relative fastness to light of various coal-tar colours when applied to leather. The experiments were made by exposing about 1,500 specimens of dyed leather to direct sunlight until the dyes faded, the fading point being ascertained by comparison with similar specimens kept in the dark and with natural undyed samples of the same leather. A complete list of the dyes experimented with is published in the *Journal* of the Society of Chemical Industry (February 15, 1902), with their relative stabilities to light as established by these investigations, but it is possible to draw certain general conclusions regarding the behaviour of the principal groups of dyes, which may be given here.

It was observed that at first many colour changes occurred, thus several blue dyes such as turquoise and new patent blues became violet or green, whilst several greens changed to slate colour, and browns in some cases became blue, green or violet in shade.

At the end of 397 days the whole of the colours had faded, and only four, viz., violamine, nigrosine W. G., fast blue 5 R. and acid violet 5 R., survived after 322 days. The most fugitive colours were the eosines, curcumen S., erythrosine, methyl eosine, naphthol green B., phloxines B. T. and N., which had faded after only nine days' exposure. In general it was observed that basic dyes were less fugitive on leather than when applied to woollen goods. These experiments are now being extended to ascertain the effect of sunlight on leathers dyed with mixed dyestuffs, the influence of the acid in the dye bath on the stability of the dye, and the effect of the various "finishes" employed on the latter.

WEST INDIAN SWEET POTATOES.

Owing to the possibility of profitable cultivation of sweet potatoes, considerable attention has been given to the potato crop by the Imperial Department of Agriculture for the West Indies, and a great deal of experimental work has been carried on. Experiments were made in Antigua with a view to determining the best varieties for cultivation. Fifteen varieties were planted and the crop from each weighed; the yield varied from '6 to 4'4 tons, the varieties "Eliza," "T.1," and "T.2," giving the largest crops. A full report of these experiments will be found in the *Report on certain Economic Experiments in connection with the Botanic station, Antigua, 1900-1901*. In Barbados alone, starches, grains, and meals, which are food-stuffs similar in composition to sweet potatoes, are imported to the value of £95,000 per annum, so that if the potato crop could be preserved for consumption during the year, it could be used instead of this imported food. Sweet potatoes will not keep without some desiccating treatment in the West Indies, the conditions for their preservation being storage in dry air at about 50° to 60° Fahrenheit. In Japan they are preserved by cutting them into slices and drying the latter in the sun. Many tons of potato meal were made by Mr. Spooner, of Antigua, who prepared it by slicing the potatoes in a chaff-cutler, and drying the slices in the sun while spread out on wire netting, the drying being complete in about eight hours.

One ton of potatoes by this method yielded 910 lb. of meal, at a cost of about £4. 10s. 0d. per ton of meal.

Dr. Voelcker, who analysed the product, found it had the following composition:—

Moisture	11'99 per cent.
Nitrogenous matter	5'12 „ „
Oil	1'19 „ „
Sugar	9'90 „ „
Starch and carbohydrates	67'01 „ „
Woody fibre	1'89 „ „
Mineral matter	2'90 „ „

As regards the keeping qualities of the meal, some of it was stored in tins for twelve months, and was then found to be perfectly good.

A large portion of the sweet potato crop is at present used for making spirit, which is shipped to Portugal and used for fortifying wines.

USAR LANDS IN INDIA.

The question of the origin of *usar* lands in the North-West Provinces of India has occasioned considerable discussion, and several suggestions as to a means of utilizing these areas have been put forward. The *Pioneer* of Allahabad gives a brief outline of a theory advanced by Mr. John Cockburn, who proposes to convert them into vast lakes. He considers that *usar* patches are the silted-up beds of jhils (shallow lakes or marshes), and that the saline efflorescence known as *reh*, which is so poisonous to vegetation, is caused by the sun's rays. The sun draws through the bed of mineral clay the water which lies beneath, and has in solution certain saline constituents which are deposited on the surface as the solvent evaporates: this mineral matter forms a light powder (*reh*) with the top surface of the clay, which is swept off by the scorching west winds.

In this manner the top layer of clay is slowly being removed at the rate of about half-an-inch a year; after a few years a depression would be formed in which water will lodge, temporarily at first, but permanently when the depth became six to eight feet. In many cases beneath the *usar* plains there exists a supply of water, and the labour expended in converting these areas into lakes again, would be more profitable than the raising of *katcha* roads (the means now employed in affording famine relief). In tropical countries lakes are more valuable than the same area of cultivated land; therefore the wholesale reclamation of marshes is undesirable, and *usar* patches should be converted into sheets of water whenever possible. By breaking up the surface layer of impermeable clay and mixing it with organic matters, etc., *usar* areas may be converted into arable land; but at considerable expense, and if large quantities of manure are not frequently added the deterioration will be very rapid.

The *reh* is of considerable value as a source of caustic soda and sodium carbonate, also of common salt and nitre. There are over two million acres of this waste land in the North-West Provinces, a large proportion being covered with *reh* indicating a pent-up supply of water, and in course of time much of it might be reclaimed in the manner described above.

LECTURES AND PAPERS.

"THE COLOURED RACES IN AUSTRALIA."

(By The Hon. SIR HORACE TOZER, K.C.M.G.)

LORD LAMINGTON presided at a lecture given by SIR HORACE TOZER, Agent-General for Queensland, at the Institute, on the 10th February, entitled "The Coloured Races in Australia." In introducing the lecturer, the chairman remarked that Sir Horace had been instrumental in bringing forward, and passing, the Act which had given to Queensland aborigines a very large measure of protection.

Sir Horace said that, for the purpose of convenience, he would divide the coloured races in Australia into the following classes:—Aboriginal natives, South Sea Islanders (usually called Kanakas), Chinese, Japanese, Coolies or British Indians from India, Ceylon, or Afghanistan, and lastly, other aliens such as Malays, Philippine Islanders, and Syrians. Of these, the colour of the first two classes might be said to be "black," the third and fourth "yellow," and the remainder "brown."

Dealing first with the aborigines, an interesting account was given of their past and present condition, and of the various attempts that had been made to civilize them. They, however, had not proved themselves able to withstand the effects of indulgence in the vices of civilization, and their extinction was only a matter of time. The lecturer had never known a single case in which any aboriginal had permanently settled down to a white man's ordinary pursuits. Although he had met with many instances in which, by education, habits of refinement, kind influence, and good example, great efforts had been made to elevate these natives to a higher social, political, or business existence, this had all been of no avail. The steps adopted by the Queensland Legislature for their protection had been the reservation of 900 square miles of territory for their use and the appointment of two principal protectors to look after them, with the police as subsidiary protectors.

With regard to the South Sea Islands, in British New Guinea, which was about to be transferred to the Commonwealth, there were a large number of natives, but they had hitherto

not come to Australia in any large numbers. However, as they were agriculturists, it had been suggested that temporary use should be made of them—in the same manner as, in England, country labour was imported from towns for hop-picking, etc.—with arrangements for their return to their country after the particular tropical agriculture, which required their services, was over for the season. This scheme would, it was said, be a benefit to them as a civilizing influence, and enable the fertile coast-lands to produce all kinds of tropical produce. Sir Horace, however, was of opinion that this arrangement was at present outside the range of practical politics, and he had never been in favour of it.

The labour necessary for the cultivation of the sugar farms in Queensland had up to now been almost entirely drawn from the natives of the Solomon and New Hebrides Islands. In appearance there was not a very marked difference between these people, the Kanakas, and the aboriginal Australian. Their hair, however was curly, their stature lower, and they had a higher intelligence, and could be utilized in almost every kind of manual labour. Accustomed to out-door work in a tropical country, they made splendid agricultural labourers; in fact, in planting, hand-weeding, washing and cutting cane in North Queensland, they performed well such work as a white labourer could not permanently do, and which no white man ought ever to be asked to do. There were not 10,000 of them in the whole Continent, and their programme of labour was so limited and restricted by statute as to be practically confined to out-door work in purely tropical agriculture. As proof of the necessity of their labour for the sugar industry, it was stated that not 100 tons of sugar were produced annually in all Queensland in the manufacture of which a Kanaka had not some part. Sir Horace here spoke very warmly on the question of deporting these people out of Australia, and hoped that, at any rate, some provision would be made for, and protection given to them, when they reached their own country.

In point of time the Chinese were the first of the coloured races to emigrate to Australia, having commenced to arrive over fifty years ago. However, as there were not now more than 30,000 of them in the whole Continent, it could hardly be urged that they had swarmed over Australia. They all came from one province of China, but were, as a rule, of the lowest and most servile class. Yet they all appeared to be intelligent and had a certain amount of education. There was good reason for believing that the Chinese Government was adverse to their emigration, so that there was little cause to dread their over-running the country. Sir Horace commented upon the reasons advanced for the exclusion of the Chinese, and the steps taken to keep them out. Their numbers at the present time in Queensland were 8,783 males and 530 females.

There were but few Japanese in the State—only 2,115 males and 154 females. Some of these were indentured labourers, under contract to return home, and others were employed in the pearl industry. In fact, the Japanese were the only reliable divers, and if they were excluded the pearl industry would probably be in a bad way. At one time it appeared as if there was likely to be an invasion of Japanese labour, but of late years all fear of that had passed, and the Government of Japan had arranged with the Government of Queensland to so check the emigration as to supply only the Queensland demand. Sir Horace was of opinion that the new Anglo-Japanese Treaty would not in any way involve a change of policy with regard to the exclusion laws, which had recently been passed by the Commonwealth Parliament, for the purpose of excluding from Australia all coloured Asiatics, although in that category were included almost entirely the working classes of Japan.

The brown people might all be classed as Coolies. There were only 939 of them in Queensland, and an Indian invasion had never been threatened.

As a general rule it might be taken that the black races, including the Kanakas, did not blend with the whites, and that, therefore, their ease was on quite a different footing from that of the yellow races, which did. Sir Horace contended that the exclusion laws, which had been passed by the various colonies before Federation, had so arranged matters that the numbers of these coloured peoples had already decreased, and that those who remained neither blended with the Europeans to any appreciable extent, nor were ever likely to give rise to any problem so serious that it could not be easily dealt with by the various States when it arose. He then more fully described the recent legislation of the Federal Government with regard to a "White Australia," which he considered premature, as the question was not of such importance to the Commonwealth as those relating to either commerce or defence, which had not received their proper amount of attention. Also he considered that the aborigines had, so to speak, a first claim on the Commonwealth, and the recent colour legislation did not relate to them.

Sir Horace quite appreciated the necessity of Australia ultimately being a white country, but maintained that the coloured races were now extremely useful, commercially, and that the time had not yet arrived for excluding them altogether. He was also aware of the advantages to be derived from Commonwealth legislation on this matter, if only for the purpose of providing one system for the entire Continent.

He maintained that a good deal of the recent legislation had not so much reference to a White Australia as to labour questions, and in this connection he instanced the law which excluded British emigrants, among others, who had engaged, before leaving home, to take up work on their arrival, a measure which he deprecated; considering that, as Australia was badly in want of population, and that other attractive countries, not so expensive to reach, offered inducements to people to emigrate, they were not likely to go to Australia unless they were first satisfied that they would be welcomed there.

After the lecture Sir Horace Tozer exhibited a number of slides illustrating the habits of the various races with which he had been dealing, and also the various industries of the State, notably of cattle-raising.

Lord Lamington, after thanking Sir Horace for a most interesting lecture, doubted whether the Home Government had been so much to blame in the matter of Argentine meat supplies as was generally supposed. With regard to the Kanaka question, he felt that Queensland had been put in a difficult position in the matter by the Commonwealth Government, and that they all felt some regret that Queensland had not been more severe in making stipulations before joining the Federation.

"NEW ZEALAND: HER RECORD AND DESTINY."

(By EDWARD WAKEFIELD, Esq.)

In the unavoidable absence of Sir JAMES FERGUSSON, the chair was occupied by the Hon. W. PEMBER REEVES, Agent-General for New Zealand, at the lecture given by Mr. EDWARD WAKEFIELD at the Institute on Monday, 3rd March, entitled "New Zealand: her Record and Destiny," who, in his introductory remarks, said that those among the audience who were New Zealanders must be acquainted with Mr. Wakefield, who had lived for many years in the colony, and they could not have forgotten the able journalist, the well-known politician, and brilliant public speaker. Had the lecturer, however, been without these personal claims, he would be sure of a most attentive hearing, if only for the name he bore, which was one of the historical names of New Zealand. If any man could claim to be the founder of the colony it was Edward Gibbon Wakefield, to whom was due the hoisting of the British Flag there 62 years ago. Very few people, at that time, had any faith in the colony. The rulers of the Empire did not think it would be at all a desirable addition to their responsibilities, and anyone who had prophesied that the time would come when New Zealanders would shed their blood for the old country in South Africa, would probably have been considered a madman. Edward Gibbon Wakefield could hardly have foreseen that, but he had foresight enough to know that in New Zealand Great Britain would acquire a splendid colony.

The lecturer said that New Zealand was a country combining the characteristics of almost all the best of the civilized parts of the world. The colony was often spoken of as the antipodes of Great Britain, but this was not correct. Its geographical position corresponded more nearly to that of Italy and Turkey. However, both the country and the people had so many characteristics in common with Great Britain, that the description of the colony as the Great Britain of the South had a good deal of justification for it.

The greater part of the lecture was historical, and Mr. Wakefield reminded his audience that the first intimation that Europeans had of the existence of such a country as New Zealand was its accidental discovery by Tasman in 1642. That explorer had given it its present name, a most inappropriate one, for it was in very many respects most unlike Zealand. The colony in fact was one of the most mountainous districts in the world, and, but for its maritime position, would bear a strong resemblance to Switzerland.

Owing to Europe having been so occupied with its wars and revolutions nothing more was heard of New Zealand for 122 years, when Captain Cook visited it. But he had been a navigator and not a colonist, and the idea of founding a settlement in the country apparently never occurred to him.

After Captain Cook many other captains touched on the shores of New Zealand, or discovered the islands round it, bringing away with them curiosities, native weapons, and tales of bloodshed and terror. Thus the country began to be surrounded with an atmosphere of mystery and romance, which excited the interest of the missionaries, who were the first civilized people to make a landing.

Mr. Wakefield described how narrowly the country escaped becoming first a Dutch and then a French colony, and stated that even the hoisting of the British Flag by Colonel Wakefield in 1840 had, at the time, been almost considered an exploit of piracy. However, the Duke of Wellington had upheld the action, and it was after him that the capital of the colony took its name.

The ideal of New Zealand's founders had been to make the colony as nearly as possible like Great Britain, politically and socially, while enjoying all the advantages of a virgin soil and perfect climate. Of the early founders Edward Gibbon Wakefield was the most important. He, in 1840, formed the New Zealand Company, and brought over 1,200 settlers who established themselves in what was now the city of Wellington.

Other settlements from time to time sprang up in different parts of the country, with more or less independent forms of government. However, when the troubles with the natives—mainly over questions of land tenure—became acute, and Auckland was turned into a great military camp, the Government changed its form and became much more centralised.

A vivid account was here given of the tribal wars of the Maoris and of the consequent wholesale slaughter, mainly due to their use of firearms, which had been the real cause of the decimation of the native races.

The war between the English and Maoris lasted, with longer or shorter intervals, from 1843 to 1869, when it suddenly came to an end. The Maoris had proved themselves to be among the best of soldiers; perhaps, behind palisades, the best. Their recent offer of service in South Africa had shown that the war had left no lasting ill effects behind it.

New Zealand was the only part of Australasia which had passed through the fire of a severe and prolonged military conflict as a condition of its existence, and in that conflict would be found one of the main causes which distinguished it so sharply from Australia.

These wars, and the consequent subsidence of the small Provincial Governments, changed the whole state of affairs in New Zealand. Up to 1869 the public works had been locally administered by the Provincial Governments, but in 1870, at the conclusion of the war, the Public Works Policy had been adopted, by which it had been decided to borrow £10,000,000 on the security of the colony, the whole to be spent in ten years on public works, immigration, and especially on railways. The results were remarkable. The whole colony entered upon a career of activity and commercial excitement. Mr. Wakefield here paid a high tribute to Sir Julius Vogel, and explained how this policy had been marred by events over which New Zealand had no control—notably by the failure of the Glasgow Bank—which had caused a demand for the withdrawal of much of the borrowed money.

An interesting description was given as to how Sir George Grey had suddenly returned to active political life, of the share he had then taken in the affairs of the colony, and of how, as legatee of that statesman's influence, Mr. Seddon had come to occupy his present position. Mr. Wakefield thought that perhaps the word "Socialism," so often applied to the legislation of New Zealand, was not an appropriate one; although wealth there was more evenly distributed than in any other country in the world, there was practically no poverty, and one could not find a man with a patch on his coat from one end of the colony to the other.

Some quotations were made from the New Zealand Year-Book to show the present prosperous condition of the country, and Mr. Wakefield considered that, with its wonderful productiveness and buoyancy, it would at no very distant date fulfil all that its most ardent enthusiasts had hoped. The country was at present simply in a state of incubation, and developments were preparing which would, in time, give new impulses upon an enormous scale. He believed that the war in South Africa had done New Zealand a great deal of good, having brought out the spirit of the people, widened their ideas, and given them Imperialistic ideals to an extraordinary extent. The future of the colony was, he contended, to be that of Queen of the Pacific. It was a purely maritime country, 1,200 miles from the nearest mainland, and surrounded by islands of great wealth and capabilities. He believed that Lord Ranfurly and Mr. Seddon were perfectly right, and were looking wisely ahead, in gradually and persistently making New Zealand the ruler of all these islands. The country had, with its unparalleled water power and land-locked harbours, a future for electricity which no other country in the world possessed, and he looked forward to seeing, in the West Coast Sounds, cities like Glasgow and Belfast which would send out their 20,000-ton steamers to successfully contend against the competition of any foreign country.

Sir James Fergusson, who arrived during the lecture, said that as a previous Governor of New Zealand, it had given him much pleasure to hear what Mr. Wakefield had had to say about the colony. He then gave some interesting anecdotes of Maori chivalry, and said he must refer to something Mr. Wakefield had said as to the warlike feeling that had been developed towards the mother-country and the Empire of which New Zealand formed so honourable a part. Something better than warlike feeling—brotherly feeling—had been developed. By their gallantry, though unfortunately they had suffered, the New Zealanders had quite recently contributed to a brilliant victory. He had been Governor of the colony twenty-six years ago, and had visited it again six years ago, when he had been much struck with the great advance that had been made in the meantime, not only from a material point of view, but more particularly with regard to the people themselves. Education, which was universal in the country, had already left its mark upon the people.

"THE COMMERCIAL PRODUCTS AND AGRICULTURAL RESOURCES OF THE CROWN COLONIES."

(By Mr. HEDGER WALLACE.)

A course of lectures recently delivered by Mr. HEDGER WALLACE at the Imperial Institute on "The Commercial Products and Agricultural Resources of the Crown Colonies" was designed, through the demonstrations, following each lecture, which he gave in the galleries of the Institute, to attract attention to the collections of products illustrative of the

resources of the various colonies which are there displayed. Mr. Wallace pointed out that the subject of the course merited examination and attention, as we inhabited an Empire and not an island, and it was, therefore, to our interest to become well acquainted with Britain-beyond-the-Seas.

The imports of Great Britain last year were stated to have exceeded the exports by about £240,000,000. It was contended that, so long as this adverse balance remained within the Empire there was not so much cause for complaint; but actually such was not the case, and the question, therefore, of where it went to was of importance, especially as most foreign nations were now deliberately trying to make themselves self-supporting and independent of one another and of the British Empire.

Under the circumstances we ought, therefore, to do two things: (1) study and understand the capacity of our own colonies and possessions; and (2) seek to open up new markets both inside and outside the Empire. In this connection we had much to learn from Germany. For instance, the German Colonial Society's Intelligence Bureau, now supported by the State, attempted to give the fullest information to would-be emigrants, and thus to attract emigration to their own colonies, in order that the German Empire might benefit thereby to the greatest possible extent. To further assist in the development of her colonies, Germany was frequently sending scientific experts to examine and report as to how such countries could be turned to the best account, the result being that, when the German Government had obtained this information, it was prepared to expend capital to develop ascertained resources, and to attract private investors.

Mr. Wallace stated that in our Crown Colonies and Protectorates little had as yet been done by the Government to ascertain and develop their resources, and he instanced the Report of Sir Charles Eliot on the East African Protectorate, in which application had been made to the Home Government for experts to make investigations, in order to find out what timber the country contained, what kind of indiarubber the natives gathered, what species of plant produced it, and what commercial tropical plants could be profitably grown. The Treasury, in response to this application, sent only one expert, and that a geologist. All the experts asked for would, Mr. Hedger Wallace contended, have been sent by Germany had the colony been a German possession. In sending a geologist, Mr. Wallace pointed out that the Government were following the precedent of the self-governing colonies, where the mineral resources were regarded as the chief attraction, and where it was generally considered that, if the mining industries were primarily assisted, the subsidiary agricultural resources would, as a matter of course, develop themselves without any such help. The agricultural development of a tropical country like the East African Protectorate could, however, be undertaken more quickly, more extensively, and more profitably than that of the mineral resources; for the metallic ores and coalfields of a district were usually more sparsely distributed than the land capable of cultivation, and were at first too expensive to work, in the absence of railways and good and cheap transit.

The British Colonies and Dependencies altogether occupied an area of about 11,600,000 square miles, but the area of island-groups of the Crown Colonies—the subject of his lectures—was only 245,000 square miles. These island-colonies differed in their forms of Government; some were entirely controlled by the Home Government; others possessed representative institutions, and the Crown had merely a vote on legislation and the control of public officers; others again were dependencies, subordinate, either to a colony with representative institutions, or to one with responsible Government, and administered by functionaries of that Government. Some were internally independent but subject to British control, and the Government of others was in the hands of chartered companies.

With a few exceptions, all the island-groups of the Crown Colonies were situated between the two tropics, and had been developed by daring and ambitious men who were either adventurous traders or cultivators. In these colonies, however, what were termed the subject-races predominated, although some of them could be regarded as self-governing politically, but this was through the small white population they contained.

These insular Crown Colonies could be divided into (1) continental islands, which were either, like Borneo, detached fragments from the adjacent continent, and separated from it by submerged or shallow banks, and where the fauna resembled that of the mainland; or, like the Madagascar group, ancient continental islands, now divided off by deep sea and with a more or less distinct fauna; and (2) oceanic islands, of either coral or volcanic formation, far away from a continent and surrounded by deep sea. Bermuda was an example of such a coral island, and St. Helena of a volcanic one, while in the Pacific group are to be found many examples of coral atolls.

Conclusions with regard to climate, etc., arrived at from the consideration of geographical position alone, were however generally erroneous, although, from a study of the flora of an area, a botanist could usually form some idea of the climatic conditions prevalent in that area.

Practically all the island-groups of the Crown Colonies were situated in three generally recognised belts. The first, the equatorial, or great evergreen forest region, extended from 12 degrees or 15 degrees on either side of the equator, and had the highest mean temperature and the heaviest rainfall, there being two areas in this belt, one with a perpetual rainfall and another with two seasons of intermittent rain. In this hot, damp climate, with little change of season, flowers bloomed throughout the entire year and fruits followed in quick succession. The second belt, the tropical or great jungle- and bush-region, extended from 15 degrees to 25 degrees north and south of the equator, and had a single rainy season, there being one long period of rain followed by another period of continuous dry weather. An interesting point was that, as a rule, the further from the equator a colony, in this belt, was situated, the greater was the day temperature, being in some cases even higher than that of places in the equatorial belt. The night temperature was, however, proportionately lower. The third, or sub-tropical, belt extended from 25 degrees to 34 degrees north and south of the equator, with a temperature ranging from 72 to 64 degrees. Very few of the island-groups of Crown Colonies were situated in this belt.

One fact to be remembered with regard to the climates of the various colonies within the tropics was that there was very little variation in their mean annual temperature. Those of Kingston, Jamaica, Zanzibar, and Bua, Fiji, for example, did not vary two degrees throughout the year.

Again, when a colony ran east and west, its isothermal lines did not usually vary, and its produce would be practically the same throughout its whole area; but, when a country ran north and south, with parts perhaps in the warm temperate and parts in the equatorial belts, the products differed accordingly and the conditions of life and labour in the island would be very varied.

In estimating the suitability of a colony for varied agricultural purposes, the most important factors to be taken into consideration, besides the soil and the climate, were good government, abundant suitable and cheap labour, and regular markets, easy of access and capable of expansion. Good government gave security, attracted capital and ensured steadiness to labour. In our Crown Colonies, Mr. Hedger Wallace stated that the officials were, perhaps, so over-anxious not to be unjust to foreign traders that an Englishman sometimes got no advantage from being under his own flag. The action of the French official (as in Madagascar and Algiers), was, in this respect, very different; in these countries the interests of the foreigner were always regarded as secondary. In many of the Crown Colonies the labour question was acute. Climate affected the manager or director of labour, who represented capital and intelligence, both in respect to health and energy, and, as a rule, quick returns and yields were looked for in a colony within the tropics. The requisite

manual labour, in many cases, could often be obtained from the indigenous races, but the conditions of life were often so easy that the native could satisfy his wants with working but very short time. Formerly, when he felt hungry he went on the war-path and plundered, and now, when necessity made him willing to work, he was often not anxious to do so for as long as his employer would be willing to pay him. This, again, opened up the vexed question of imported labour.

Mr. Hedger Wallace dealt fully with many other interesting points, and described at length the resources of the various colonies included under the term island-groups of the Crown Colonies, while, in the galleries of the Institute, after each lecture, he pointed out the leading products of each colony, explaining how they were grown or obtained, and the purposes to which they were commercially put.

"RUSSIA AND THE RUSSIANS."

(By MR. ALEXANDER KINLOCH.)

(ANGLO-RUSSIAN LITERARY SOCIETY.)

At the monthly meeting of this Society, Colonel Lambert in the chair, a lecture on "Russia and the Russians" was delivered on April 1, by Mr. Alexander Kinloch, hon. secretary, who remarked that, whilst Russia and England are the two largest and the two greatest Empires in the world, they each possess to a remarkable degree what the other lacks. For which reason, seeing that the two nations are slowly but surely drifting with their frontiers into a contiguous line of proximity in Asia, it is eminently desirable that a wider and sounder commercial intercourse than heretofore should be established between them.

Mr. Kinloch gave a rapid sketch of the origin and the racial characteristics of the Russians from the period of the Slav migration into Europe, of the introduction of Christianity, the Tartar invasion, the struggle for supremacy with Poland, the transformation of Russia from an Asiatic into a European nation by the far-seeing policy of Peter the Great, the emancipation of the serfs; and concluded with a general survey of the present social, political and religious condition of the people. According to the lecturer, the progress of Russia, in general civilization, in art, commerce and education has been greater during the last 40 years than in the whole of the preceding two centuries (see *Russia, its Industries and Trade*, Glasgow International Exhibition, 1901). The lecturer dwelt in particular on the home-rule aspect of the *Mir*, the Village Commune, in which woman as head of a household, has a vote on a par with men.

The national institution of public baths, the weekly use of which is religiously observed by every Russian, was a contradiction of the foreign opinion that the Russians were a dirty people. The strong religious sentiment of orthodox unity and the almost fanatical loyalty to *batushka*, the tsar, so deeply rooted in the peasantry, will always serve in the opinion of the lecturer as a powerful deterrent to the spread of any serious revolutionary movement in Russia.

The lecture was illustrated by admirable lime-light views especially prepared and presented by the Kodak Co.'s agent at Moscow, and by Capt. Daunt, I.C.S. Among the former were new and hitherto unpublished portraits of Tolstoi and Gorki.

In the absence of the president the hon. secretary, before beginning his lecture, commented in sympathetic terms on the painful loss the Society had sustained in the death, on 29th March, of Sir Sidney Shippard, a highly esteemed member of its committee.

PROCEEDINGS OF INSTITUTIONS.

ROYAL AGRICULTURAL SOCIETY OF ENGLAND.

The usual monthly meeting of the Council was held on the 9th ult., PRINCE CHRISTIAN (president) in the chair. The Earl of Radnor was elected a governor of the Society, and 30 new members were elected. Mr. Bowen-Jones, in presenting the report of the Chemical and Woburn Committee, said that the British Oil and Cake Mills (Limited), an organization comprising and controlling about one-half of the principal firms of cake manufacturers in different parts of the country, had now decided that, so far as the branches under their control were concerned, they would give up the use of the "95 per cent." guarantee, and conform to the recommendations given by the Royal Agricultural Society of England, which were to the effect that linseed cake should be sold as "pure and in good condition."

The Hon. C. T. Parker presented a report made to the Veterinary Committee by Professor McFadyean, which stated that during the last four weeks for which returns had been issued there had been 55 outbreaks of anthrax with 113 animals attacked, as against 52 and 59 respectively for the corresponding period of last year. The number of outbreaks of glanders for the same four weeks was 95, and the number of animals attacked 169, as against 97 outbreaks and 145 animals attacked last year. Four cases of rabies, all in dogs, had been notified during the last four weeks in the counties of Pembroke and Cardigan, making a total of seven since the beginning of the year. The recent returns indicated a considerable decline in the prevalence of swine fever; the total number of outbreaks reported during the last four weeks was 109, as against 286 in the same period of last year. It was greatly to be regretted that foot-and-mouth disease had again appeared, an outbreak having been discovered near Canterbury in the last week in March.

Mr. Sanday reported from the Implement Committee that 10,702 feet of total shedding had been allotted in 338 stands in the implement department of the society's forthcoming meeting at Carlisle from July 5 to 7 next, and that the entries of new implements numbered 53.

Lord Moreton reported from the Education Committee that a total of 69 entries had been received for the examination for the national diploma in agriculture to be held jointly by the Royal Agricultural Society of England and the Highland and Agricultural Society of Scotland at the Yorkshire College, Leeds, from May 5 to 8 next.

Mr. Crutchley said that there was every reason to hope that the show of 1903 would be held on the new permanent site at the usual time—namely, the week after Ascot.

Other business having been transacted, the Council adjourned until Wednesday, May 7 next.

THE LONDON CHAMBER OF COMMERCE.

The monthly dinner of the London Chamber of Commerce held on the 9th ult., was followed by a discussion on West Africa. SIR GEORGE TAUBMAN GOLDIE presided and, in opening the discussion, said that 20 years ago our West African territories consisted only of two or three scattered strips of coast line, but to-day we possessed a West African Empire, covering an area many times as large as the British Isles. With regard to internal settlement, a good deal remained to be done, but the completion of the work was only a question of time, because it was no longer imperilled by foreign interference or foreign intrigue. Political supporters and opponents of Mr. Chamberlain must alike admire the vitality and vigour which he had imported into West African affairs since he took office in 1895. Nor would this benefit altogether cease with Mr. Chamberlain's tenure of office, for we might feel sure that the seals of the Colonial Office would never again be entrusted to any but the most able Ministers of the Crown. Dealing with the labour question, he said he believed that in the Hausa race there was a reservoir of labour which would not only supply all the require-

ments of their own country, but overflow, in the first instance, into the Gold Coast and the neighbouring regions, and afterwards into our possessions south of the Zambesi. Pending the establishment of a real emigration scheme from Hausaland, he thought that, in order to meet any shortage of labour in the Gold Coast, temporary recourse would have to be had to the Chinese. There were many objections to such a policy, and no doubt it would be desirable to make arrangements for sending the Chinese back to their own country when native labour became available. He felt confident that, in the not distant future, West Africa would be one of the most flourishing possessions of the British Crown.

Lord Duncannon referred to the failure of those interested in the mining industry to found a West African Chamber of Mines, and said that it was now proposed to start a mining section of the West African department of the London Chamber of Commerce.

Sir Harry Johnston remarked that in West Africa, as in East Africa and South Africa, he should like to see our policy tending towards something like unification of administration. Let there be but one Budget for the whole of West Africa, instead of one colony being anxious to swell its little revenue without any concern for neighbouring colonies or protectorates. He thought that we were much behind Germany and France in respect of the scientific examination of the territories under our control. This was an important matter, but the attitude of the Foreign Office was utterly unsympathetic with regard to it. He believed that, if a few thousand pounds had been spent on the scientific examination of Uganda, the railway would have been constructed for £750,000 less than it cost. There were many parts of tropical Africa under our sway which were not likely at any time to be suitable for residence by white people, but they might contribute indirectly to the prosperity of this country if well and wisely governed. At any rate, our object should be to prevent these possessions from remaining a financial burden to the taxpayers of Great Britain. He was in favour of the natives paying a small hut-tax. The native should have full rights, and endeavour to justify his claim to them by bearing his proper share of the cost of governing the country. If the people were afforded the opportunity of earning wages he believed no objection would be made to any such small tax.

THE ROYAL UNITED SERVICE INSTITUTION.

At a meeting of the Institution, held on the 10th ult., SIR JOHN COLOMB, M.P., submitted for discussion two papers on the subject of "The Garrisoning of our Coaling Stations." LORD HAMPDEN presided.

Sir John Colomb stated his reasons for thinking that we had exaggerated risk and had overdone the fortifications of coaling stations, and consequently garrisons, and said that he did not accept the War Office standard of the numerical strength of the garrison establishments as a guide for the Admiralty in the event of their taking over any of these bases. He submitted that on any distant naval station the outbreak of war should not find our admiral without force at his disposal and available for general service afloat or ashore, exclusive of the complement of his ship. As to what was to be done with the supernumerary force in peace, he said it should obviously be at the base, and if there, he asked why should not the nucleus of the reserve force for war form the peace garrison. Whatever might be the peace arrangement it was certain that in war a force of some sort would be required in the future, as in the past, for minor operations at ports and on coasts. The release of the peace garrisons for general service was a question of reserves trained and adapted to take their place promptly on the outbreak of war. His view was that we could look to the colonies for producing such a force in war, which should be kept in reserve in peace. He advocated the garrisoning of two naval bases in the other hemisphere as a step in the development of a policy of embracing colonial auxiliary reserves for general service in war under the admirals; and he urged that within certain limits the garrisoning of distant bases with marine forces would not be detrimental to the efficiency of the fleet and would not deteriorate the marines. He pointed out that, as compared with the executive branch, the marine branch had declined by 14·1 per cent. between 1858 and 1900, so that in a year of mastless armoured vessels there were, roughly speaking, 5,000 fewer marines than, according to the 1858 standard, was considered the proper proportion in days of rigged ships. He was in favour of restoring the old ratio, and said that an addition of 5,000 marines to the present force for garrisoning work could be justly and fairly held to be a moderate and reasonable proposition. By combining the question of naval garrisons with that of colonial naval reserves, a beginning might be made with the definite object of providing for the immediate and pressing requirements of the China station in the event of war. Probably the view taken by the colonial Governments concerned would be more influenced by the precise nature of the proposition than by the abstract principle of its justice. The proposition might take the form of a compromise over the colonial naval reserve question.

In short, Australia and Canada should jointly undertake to provide a naval auxiliary reserve force for general service in war, the numerical strength of which should be determined by reference to the immediate requirements of the China station on the outbreak of war. The cost to the colonies would be insignificant; the object would be definite. He was apprehensive of an outbreak of maritime war overtaking us and finding our admirals on distant stations without any force but the complements of their ships to carry out coast operations incidental to, and inevitable in, maritime war. It was a policy which he was convinced was fraught with peril. On the other hand, there was an evident, if somewhat theoretical, desire on the part of the colonies to create naval reserves, but a disinclination to accept conditions as to pay, training, service afloat, etc., which unless imposed and accepted would not produce really effective and efficient results. This course, suggested as a definite policy, would fill the gap in our arrangements which any comprehensive view of the situation on the outbreak of war disclosed; and it offered a practical mode for embracing colonial aid for the prosecution of operations incidental to maritime war. The lecturer discussed the questions raised in his memorandum at considerable length, and dealt with various objections to the proposal to substitute marine for army garrisons and to transfer their control and custody from the War Office to the Admiralty. In conclusion, he said that these were some of the purely naval aspects of the question. It appeared to him that our commercial and economic position—wholly dependent as it was upon sea security—was now such that it could not endure prolonged abnormal strain. The prompt and decisive assertion of naval power, on the outbreak of war, seemed to him to be the essential paramount condition of our economic survival. He felt more concerned, therefore, in arrangements to enable our admirals to deal quickly and effectively in their several stations with the ships of the enemy, wherever found, than in army corps to sit down and wait behind hedges in Sussex or in hop-gardens in Kent, on the "off chance" of being some use when the British economic position was in ruins because our naval means had been found insufficient and the organization of our naval stations had been proved by war to be incomplete.

In the discussion which took place, Colonel R. H. Veitch said that he had had the question of the land defence of our naval bases under his notice for some years in positions of responsibility. The manner in which Wei-hai-wei had been dealt with, he admitted, was somewhat perplexing, but it was a matter of detail and not of principle. The question raised by the lecturer was, on the other hand, one of principle. The Navy was our first line of defence, and it was the duty of the second line—the Army—to enable the Navy to carry on its operations efficiently and to protect the naval bases. The Navy was none too strong for them to trifle with it in the way urged by Sir John Colomb. If the control of the naval ports were handed over to the Admiralty, there was danger that the Admiralty would think of the ships first, and the ports last.

Rear-Admiral W.H. Henderson considered that the memorandum and the letter were of an extremely high order, and he was in general agreement with the principle which they contained. With regard to the marines, the reason why many of them left was because when they had finished a period of service there was no further outlook for them. This was a matter which they should keep in view. The question raised by Sir John Colomb was one of Imperial policy. Our Imperial policy of defence was in a state of chaos; we were unorganized, and until we got a Council of Imperial Defence that would lead the way and give us light he thought that we stood a chance of failing if we were pitted against other nations. It was necessary for us now to follow the natural law of central control. At the present time there was no control over the Admiralty and the War Office in this matter of Imperial policy; they did their very best with the highest motives, but naturally and instinctively they must fight and work for their own hands. Until some central control was established no scheme such as Sir John Colomb had brought forward had the slightest chance of standing. Our main defect was want of organization. He hoped that at the conference of colonial Premiers when they came over for the Coronation some steps would be taken to put our Imperial policy of defence upon a higher plane with higher organization.

THE ROYAL STATISTICAL SOCIETY.

A meeting of the Society was held on the 15th ult., when a paper on "Factory legislation considered with reference to the wages, etc., of the operatives protected thereby," was read by Mr. GEORGE H. WOOD. LORD AVEBURY, the president, was in the chair. After reviewing the factory legislation of the past century, Mr. Wood dealt with the effects of legislation on women's wages. He said that until the Act of 1847 the legal reduction of hours of labour did not reduce women's wages, but was generally followed by an increase. The Act of 1847, which reduced the hours in the textile trades, was passed during a very severe trade depression, the influence of which vitiated comparisons, but the evidence showed that the reduction in hours reduced earnings for a time but not proportionately, and, further, that the loss was recovered in a few years. This was due to the beneficial effects of the Act on the workers. In the case of the extension to bleaching a similar feature presented itself. Wages fell in 1861, the year after the passing of the Act, but two years later they had risen to a higher level than before. There was a general rise of women's wages after 1860 until 1874-77. The Act of 1874 again reduced the hours in the textile trades, and ultimately wages rose to a higher point than at the period before the passing of the Act. He illustrated by means of index numbers the changes in the levels of women's wages. When the changes in the general average of women's wages in 16 industries were compared with changes in the average of a large group of industries employing both sexes, it was found that women's wages had risen faster and more regularly than the average of all. A table setting forth the changes in the proportionate numbers of men, women, young persons, and children employed, at various periods in the chief textile industries showed a great reduction in the employment of children, a displacement of women by men in the worsted trades, and, except in the cotton and wool trades, a tendency to increase in the proportionate numbers of men employed. Factory legislation had not, on the whole, resulted in the displacement of "protected" by "unprotected" workers. Neither had the extension of the Factory Acts adversely affected the foreign trade; while, on the other hand, it was submitted that the whole community had benefited either directly or indirectly. In view of those facts, the author argued that further extension to include the "sweated" industries was desirable. In the discussion which followed the chairman remarked that it was curious that the attention of Parliament and the Government should be so much attracted to the factory class of the community, while the class of shop assistants was rather neglected.

COMMERCIAL INTELLIGENCE DEPARTMENT.

CORRESPONDENCE AND ENQUIRIES.

The following are given as specimens of some of the enquiries which have been addressed to, and satisfactorily answered by, the Institute during the past month (April).

*** All communications must be authenticated by the name and address of the writer. Enquiries which would involve special applications or expense will be a matter of arrangement with the correspondent.*

- C. S. C. & Co., London.—Production and use of margosa oil.
- O. H. & Co., Leeds.—Silk dyeing.
- E. A. Q., Oxon.—Makers of fish hooks.
- G. E. C. & Co., London.—Ferro compounds.
- S. P. & Co., London.—Shippers of timber from North Borneo.
- Verbal.—Climate, etc. of Northern Nigeria.
- " Dika-fat from West Africa.
- " Climate and cost of living in Hong Kong.
- " General prospects in New Zealand.

REQUIREMENTS REGISTRY.

In order to provide correspondents with an opportunity of making known special "wants" or "needs" in the British Colonies, India, and Foreign Countries, space will be regularly devoted to the publication of approved notices in the IMPERIAL INSTITUTE JOURNAL. Notices, as a rule, should not exceed 25 words in length, for which a charge of 2s. 6d. will be made for each insertion. Special arrangements can be made for longer notices.

SPECIMENS OF FOREIGN AND COLONIAL WOODS desired. Purchase or exchange. Names and localities must be well authenticated. Address—HERBERT STONE, BRACEBRIDGE-STREET, BIRMINGHAM.

THE CURATOR OF THE CANADIAN SECTION OF THE IMPERIAL INSTITUTE is prepared to furnish information about Canadian Trade and to supply names of importers, manufacturers, shippers, etc.

The following trade enquiries have been received at the Canadian Section of the Imperial Institute, from the Curator of which Section further particulars may be obtained:—

- Home Enquiries.**—A manufacturer of various kinds of deed and cash boxes is prepared to appoint a responsible Canadian resident agent to introduce these goods.
- A firm claiming a good connection with the trade in all parts of the United Kingdom, wish to secure a first-class Canadian agency in white mouldings for pictures, hardwood mouldings, mouldings for mantels, etc.
- A manufacturer of vulcanite pens and other goods seeks a capable Canadian resident agent.
- A Lancashire firm ask to be furnished with the addresses of the leading Canadian manufacturers of bedroom suites, tables, chairs, desks, and other furniture.
- A manufacturer of writing inks seeks responsible Canadian resident agent.
- An Irish firm desire names of principal Canadian manufacturers of bacon, etc.
- A company manufacturing chemists' specialities and flavouring essences, etc., seek responsible Canadian agents.
- A Liverpool firm ask to be placed in correspondence with Canadian makers of wood clog soles.
- A London firm dealing in macaroni, vermicelli, peels, and essential oils, would like to hear from Canadian importers of these articles.
- Canadian Enquiries.**—A Canadian company about to undertake the production on a large scale of dowels, skewers, window shade rollers, and other descriptions of wood-working

goods, are sending a representative over who would be pleased to hear from importers of this class of goods.

A Toronto firm of manufacturers' agents wish to be placed in communication with the United Kingdom manufacturers of stationery articles, Christmas cards, and similar goods.

A Canadian firm manufacturing maple skewers wish to get into communication with British importers of same.

A Montreal house whose travellers cover Eastern Canada, wish to hear from United Kingdom manufacturers of grocers' specialties, novelties, and stationery goods, seeking representation in Canada.

A Canadian company packing bacon and other pork and beef products invite correspondence from importers.

Foreign Enquiry.—A firm in Hamburg wish to be supplied with the names of Canadian exporters of pigs' heads in pickle, feet in salt, and various kinds of bacon.

MAPS AND CHARTS.—RECORDS.

[The entire collection of maps (with the exception of a few atlases and maps issued by private firms) consists of authoritative publications of the various government cartographical departments. Such as: the One-inch Ordnance Survey of Great Britain and Ireland, a complete set of Admiralty Charts, and a selection from the maps compiled in the Intelligence Division of the War Office; the monumental "Indian Atlas," and a large number of the publications of the Surveyor-General's Office, Calcutta; the Geological Survey of Canada, and the Government Surveys of Victoria and New South Wales. In the arrangement of the collection, the geographical classification of the War Office Intelligence Department catalogue has, with some modifications, been followed.]

ADDITIONS TO THE COLLECTION OF MAPS DURING APRIL, 1902.

AFRICA.

I.D.W.O.

Egypt.

SUDAN SURVEY, No. 1489:—Boma.

Presented by the Director-General of Mobilization and Military Intelligence.

ASIA.

Survey of India Office, Calcutta.

India.

INDIAN ATLAS, quarter-sheets 49, 51, 86.

LOWER PROVINCES REVENUE SURVEY, district Monghyr.

district Purnea.

BENGAL SURVEY, 1 inch to a mile, sheet 164.

BURMA SURVEY, 1 inch to a mile, sheets 72, 113, 147, 149, 353.

UPPER BURMA SURVEY, 1 inch to a mile, sheets 294, 385.

CENTRAL INDIA AND RAJPUTANA SURVEY, 1 inch to a mile, sheets 144, 168, 211, 235, 418, 466.

HYDERABAD SURVEY, 1 inch to a mile, sheet 210.

SIND SURVEY, 1 inch to a mile, sheets 12, 31.

PUNJAB SURVEY, 1 inch to a mile, sheets 81, 82.

INDIA, showing railways with stations, 1899.

INDEX TO THE STANDARD SHEETS OF THE PUNJAB.

CHART OF TRIANGULATION, 1901.

CHARTS AND PLANS.

Published by the Hydrographic Department, Admiralty, during January and February, 1902; J. D. POTTER, Agent, 145, Minorities, London, E.C.

No.

New Charts.

3164 England, west coast; Morecambe bay:—Barrow harbour.

109 England, east coast:—Entrance to the river Humber. (Plans:—Kingston-upon-Hull, Grimsby road.)

3165 Ireland, west coast:—Bantry and Glengariff harbours.

3217 North America. Newfoundland, east coast:—Pilley island harbour.

3167 Cuba, north coast:—Puerto Padre.

1324 South America, east coast:—Buenos Aires to cape Dos Bahias.

3162 British Columbia. Discovery passage.

3178 British Columbia. Plans in Discovery passage:—Gowlland harbour. Otter cove. Elk and Duncan bays.

3251 Aleutian islands:—Dutch and Iliuliuk harbours.

3180 Gulf of Aden and Red Sea:—Straits of Bab-el-Mandeb and approaches.

3254 Australia, north coast:—Norman river entrance.

3179 Australia, south coast:—Plans on the south coast of Australia:—Starvation boat harbour.

3189 Australia, south coast:—Cape Le Grande to Cape Pasley.

1719 Italy, west coast. New plans:—Giannutri isle. Gergouia island. Pianosa island.

911 Plans of anchorages between Borneo and New Guinea. Plans added:—Wei Pelau and Awa anchorages.

979 Pacific islands:—Between 160 E. and 150 W. long. New plan:—Pleasant island. Plan added:—Ocean island.

Charts that have received additions or corrections too large to be conveniently inserted by hand, and in most cases other than those referred to in the Admiralty Notices to Mariners.

No.

1188 The World:—Coal and telegraph chart.

2253 England, south coast:—Dartmouth harbour.

2682 Bristol channel:—Nash point to New passage.

122 Netherlands:—Mouths of the Maas.

2322 Netherlands:—Zuider Zee.

1071 Norway:—Approaches to Trondjem.

863 Labrador:—Hudson bay and strait.

2806 United States, east coast:—Charlestown harbour.

472 Haiti, or San Domingo:—Harbours and anchorages on the coast of.

2259 Colombia:—Savanna harbour.

1319 Chile:—Conception bay.

22 Persian gulf:—Kuweit harbour.

2757 Banka strait to Singapore.

No.

9426 Eastern archipelago, eastern portion.

1602 China, north-east coast:—Approaches to the Yang tse Kiang.

1601 China, north-east coast:—Wusung river.

857 China, north coast:—Kyan chau bay.

358 Japan:—West coast of Kiusiu and Nipon.

1055 Australia, west coast:—Bedout island to Cape Cuvier.

2731 Australia, south coast:—Geelong harbour.

16702 Australia, east coast:—Moreton bay, sheet 1.

2766 New Guinea, north-east coast.

979 Pacific islands between 160 E. and 150 W. longitude:—Plan of Maua-hiki on this sheet.

THE SUGAR BOUNTIES.

At a recent meeting of the British Chamber of Commerce in Paris, Mr. H. Millington-Drake read an interesting paper on the "Rise and Fall of the Sugar Bounties." In the course of his remarks he said that, possibly, the simplest definition of a bounty is "Money taken from the mass of the taxpayers and handed over to a small number of individuals or societies who have had eloquence or interest enough to persuade the Government that they should have it." For several years past in France, for every bag of sugar (of 100 kilos.) exported the maker has received on an average about 10 fcs., which has had to come from the pocket of the taxpayer, with the consequence that the consumer here pays dearer for his sugar than in any other country in the world. In France the tax on sugar is 64 fcs. per 100 kilos., or over 200 per cent., and as Mr. Yves Guyot has said: "Si le consommateur français ne se révolte pas contre la surcharge qui le frappe, c'est parce qu'il ne s'en rend pas compte." Between 1884-1900 the sum of 764,000,000 fcs. has been paid to French manufacturers, which it has been estimated represents over 100 per cent. more than the value of the factories themselves.

The history of bounties would take us back to 1648, but as at that time they only concerned cane sugar they may be ignored for the present. It was not until 1747 that a German chemist discovered that many roots contained sugar, especially the beet-root. A factory was started in 1801 to exploit this discovery near Breslau, and shortly afterwards two factories were established in France, but the expenses of extraction were great and they met with little success as a commercial venture. The English blockade of European ports in 1810 which prevented West Indian sugar entering France, caused Napoleon to turn his attention to beet-roots, hoping to raise sufficient to meet the needs of sugar consumption in France, and in 1812 the French Government placed at the disposition of the Minister of Agriculture

100,000 arpents de terre (about 100,000 acres) 1,000,000 fcs. and exemption from all taxes, which may be said to be the beginning of bounties. The beginning was slow, and general peace caused a heavy decline in prices. In 1829 France contained 100 factories producing only 5,000 tons of sugar,—about a fortnight's production for a single big factory to-day. At this time France was going ahead of Germany, neither country receiving any bounties. In 1836 France had 436 factories making 49,000 tons of sugar, at which time a consumption duty of 15 fcs. per 100 kilos. was put on with disastrous consequences, no less than 166 factories coming to grief. This is somewhat remarkable in view of the fact that the duty is now 64 fcs. instead of 15 fcs.

Coming to more recent times we may fix the date of the bounty war as having its origin about 1871, after the Franco-Prussian war, when Germany began to make real industrial progress. In 1870 France manufactured 290,000 tons of sugar against Germany 186,000 tons. To-day Germany produces 2,300,000 tons against 1,150,000 tons made in France. What brought about this marvellous result in Germany? Most people will reply, "Bounties," but this is only partially true. A bounty on production existed in 1870, and the intention of the German Government was to diminish it until it was completely extinguished; she showed her good faith by reducing it, as we shall see later.

The real reasons of the remarkable success of Germany may be traced to the magnificent soil of the Elbe Valley, similar to the very best soils in France; the establishment of large factories, the use of diffusion instead of presses, selection of roots for quality, great care in cultivation and bringing in the roots, use of manures, great care and scientific study in manufacture, and cheapness of field labour. These are the reasons which caused Germany to advance from 200,000 tons in 1870 to 1,123,000 tons in 1883-5, whilst France had gone from 296,600 tons to 400,000 tons in 1883-4, and dropped in 1884-5 to 272,000 tons. (Germany was then producing a root which gave 10.78 per cent. of sugar against about 6 per cent. in France.)

A heavy fall in prices from 16s. to 10s. caused a crisis in the year 1884-5, and France cried out that she was being ruined and must have bounties like the Germans, whereupon the law of 1884 was passed and framed in such a way that the manufacturer had great advantages in producing a rich root, the "prise en charge" being fixed at 6 per cent. on refined sugar, rising later to 7.75 per cent., at which it now stands. The quality quickly began to catch up to the German standard, and manufacturers who vowed that in French soil a root giving more than 7 per cent. sugar could not be raised, to-day find 12 per cent. to 13 per cent. of raw sugar in their roots against about 14 per cent. in Germany. The Germans did not reply to this law in any way, but on the contrary, in pursuance of their original policy they reduced their bounties, which in 1887 were valued at 4 marks 90 per 100 kilos. of exported sugar, to 2 marks 12, which remained in force until 1892, when she ceased to give "primes à la production" and replaced them by a very moderate direct premium on exportation of 1 mark 25 per 100 kilos., which was to be further lowered in 1895. Ere this date, however, the effect of bounties in forcing the production regardless of consumption was making itself felt, and another crisis came in 1895, when the price of sugar fell to 8s. 6d. for raw sugar f.o.b. Hamburg—a price hitherto undreamt of.

The voice of the powerful agrarian party in Germany made itself heard, and after maintaining the law of 1894 for another year they doubled their direct bounty on raw sugar, making it 2 marks 50 from the 1st August, 1896. France took this action as a challenge, and the double bounty was referred to in the newspapers and afterwards in the Chamber as "Prime de guerre" by means of which Germany was to beat France out of the English market. The first demands of France were, however, very moderate, all they proposed to ask their Government for was a transference of 2 fcs. of the indirect bounty voted by the law of 1884 to a direct "Prime à l'exportation." The bolder spirits said "Ask and ye shall receive," and instead of 2 fcs. they asked for 4 fcs. direct increase. After a bitter fight Messrs. Méline and Ribot succeeded in passing the law of April, 1897. This law did more than anything else to precipitate the present crisis, the last straw towards which was the formation of the German Cartel or Trust a year ago. The crisis would have arrived sooner had not the Cuban war in 1895 interfered with the production in Cuba, Porto Rico, and the Philippines.

The Convention signed at the Brussels Conference on March 5 abolishes all bounties direct and indirect from the 1st September, 1903, and reduces to a uniform rate of 6 fcs. per 100 kilos. the high protective tariffs which alone in Germany and Austria make the formation of Cartels or Trusts possible. The effect of the bounties has been to increase production and reduce the consumption in the producing countries, and, as many men here have seen for a long time, the only cure is to withdraw the bounties and increase the consumption at home.

NEW BOOKS, etc.

ABEL HEYWOOD AND SON. (Manchester, 1900.) *The Making of the British Colonies. A short account of the Origin and Growth of the Principal Colonies of Great Britain.* By the AUTHOR of *The Making of Europe*, (Nemo). Svo., pp. xi. + 167. This book is designed as a text-book for schools, and contains a series of sketches, written in a terse and graphic style, giving an account of the origin and growth of the principal British Colonies, and some idea of their future development. A correct knowledge of the various portions of the British Empire is most essential at the present time, especially to the younger generation in England, many of whom may become settlers in the colonies, and should make themselves intimately acquainted with the prospects and capabilities of these new lands. This information will be found in a condensed and readable form in this volume, which will also be of interest to general readers.

A. W. BAYLY & CO. (Lourenço Marques.) *The Delagoa Directory for 1902. A Year-Book of Local Information regarding the Port and Town of Lourenço Marques.* Fourth issue. Svo., pp. 100. (Price, 2s. 6d.) This Year-Book contains useful data and information concerning Lourenço Marques, the port of Delagoa Bay, which has been termed the finest harbour in South Africa. The development of Lourenço Marques has been greatly retarded by the apathy of the Portuguese, who are slow to introduce many much-needed improvements, and also by the reputation the place has acquired for unhealthiness, owing to the swamp-land in its vicinity. This swamp is now being rapidly filled up, and the sanitation is better attended to. The town and suburbs are well lighted by electricity and the water supply is fairly satisfactory. The harbour works have been commenced, and a system of electrical tramways has been arranged for, to be completed within 22 months. The population is about 6,000, of whom about 3,000 are Europeans. As Lourenço Marques is the natural outlet for the produce of the Transvaal, it is likely in the near future to become of great commercial importance. The Directory should prove valuable to business men and manufacturers who may desire to open up commercial relations with Delagoa.

EDWARD LLOYD, LTD. (London.) *The Municipal Year-Book of the United Kingdom for 1902.* Edited by ROBERT DONALD, Editor of *The Municipal Journal*, and *The London Manual*. Svo., pp. xxxiv. + 578. (Price, 3s. 6d.) This work contains useful information and statistics relating to the various Boroughs of the United Kingdom, arranged in a concise form for reference, together with lists of the Members of the Councils and chief officials. The Urban and Rural District Councils are also given, and the work of municipal bodies with regard to telephones, water and gas supply, electricity, tramways, and the housing of the working classes, is also fully recorded. Last year showed a considerable increase and development in municipal work. There was a great extension of tramway enterprise, and much activity was displayed in municipal housing. The new Act which enables municipal authorities to build outside their own boundaries

is being taken advantage of. This Year-Book is a most useful work of reference on municipal matters, and its value increases yearly as the work of the local authorities becomes more widely extended.

EDWARD STANFORD. (London, 1901.) *The Gold of Ophir, whence brought and by whom?* By Professor A. H. KEANE, F.R.G.S. Crown 8vo., xviii. + 244 pp. (Price, cloth 5s. net.) The mystery which has enveloped the "Land of Ophir" appears now to have been dispelled, as Professor Keane in his interesting essay proves almost conclusively that the "Gold of Ophir" was derived from Rhodesia (Havilah) and was worked and brought thence by the Himyarites (Minceans and Sabceans), by way of Sofala (Tarshish) to Dhafar in South Arabia, which Professor Keane identifies with Ophir. From Ophir the gold, together with the spices grown on the neighbouring Mt. Sephar, was carried to Ezion Geber in the Red Sea, and on to Jerusalem by caravan. The re-discovery of the Zimbabwe monuments in Rhodesia, with careful explorations of the whole ground by the late Mr. Theodore Bent, Mr. R. Swann, and others, and the mapping-out of the numerous ancient workings, have given the indispensable clue to the solution of the Ophir question. The prototypes of these Rhodesian monuments have been found in the Himyaritic ruins of Yemen, showing that the old gold workings found south of the Zambesi are to be ascribed to the ancient Himyarites of South Arabia. Professor Keane has consulted all the published materials and evidence bearing on the question, and his book will be found most interesting by biblical and archaeological students.

GEORGE ALLEN. (Charing-cross-road, London, 1902.) *The Literary Year-Book and Bookman's Directory, 1902.* Edited by HERBERT MORRAH. With portrait of Sir Walter Besant. Sixth issue. 8vo., pp. 468. (Price, 3s. 6d.) The present issue of this Year-Book shows a considerable improvement as compared with previous editions, being more complete and representative. The Directory of Authors has been greatly enlarged, and much additional information will be found in the other sections of the work. Great care and labour have been bestowed on the compilation of the volume, which will be found a handy work of reference by all who are engaged in literary work or have any connection with books.

HARRISON AND SONS. (London, 1901.) *Our Empire, Past and Present.* By the EARL of MEATH, M. H. CORNWALL LEIGH, LL.A., and EDITH JACKSON. With Portraits, Illustrations and Maps. Vol. 1.:—Great Britain in Europe. 8vo., pp. 417. (Price, 7s. 6d.) This work will be issued in five separate volumes, each complete in itself, and the series is designed to show the growth of the British Empire from the earliest times down to the present. The first volume deals with Great Britain in Europe, and opens with a short record of Imperial progress. This is followed by a chapter on the growth of freedom and government at home. The growth of sea-power, the chief factor in the expansion of England, is fully described, and also the making of the United Kingdom, by the union of Wales, Scotland, and Ireland to England. The volume concludes with an account of the European dependencies of Great Britain—the Isle of Man, the Channel Islands, Gibraltar, Malta and Cyprus. The book will serve to show how the Empire has been built up, and increase the desire to learn more of the immense opportunities that have been opened up for the benefit of its population, and of the world at large. The compilation of the volume has been carried out with evident care and attention to accuracy, it is well illustrated, and some useful maps are inserted. It is prefaced by an admirable portrait of the late Queen Victoria, to whose memory the work is dedicated.

HORACE MARSHALL AND SON. (London.) *The Story of Egypt.* By W. BASIL WORSFOLD. (*The Story of the Empire Series.*) Sm. 8vo., pp. 225. (Price, 10s. 6d.) This volume of *The Story of the Empire Series* contains a concise and lucid account of the British occupation of Egypt, from which the country has derived so much benefit. A brief résumé of the history of Egypt from the earliest times is given, and is followed by a rapid survey of the events that led up to the revolt of Arabi Pasha, and the introduction of British control over Egypt in 1883. The improvements effected in the condition of the country since that date are clearly shown. The progress made, both materially and morally, is most striking, especially as regards the administration of justice, and the increase of education. The whole aspect of the country has been changed, and where, before the advent of British rule, the people were generally in a most wretched state of poverty, now the Fellaheen and peasant proprietors are able to pay their way. The population of Egypt has increased in 15 years by 2,920,486, i.e., 43 per cent. Mr. Worsfold's book will be read with interest, as it conveys a clear idea of the peculiar conditions in which Egypt is placed, and the difficulties which have been overcome by the British officials who have had to administer its Government.

JOHN MURRAY. (London, 1902.) *The Constitution of the Commonwealth of Australia.* By Professor W. HARRISON MOORE. 8vo., pp. xix. + 395. (Price, 16s. net.) This book contains an ably-written exposition of the new constitution of the Commonwealth of Australia, which will be of interest to all who may desire to become acquainted with the growth and establishment of the Federal Government. In the opening chapters the author, who is Dean of the Faculty of Law in the University of Melbourne, deals fully with the sources of the laws and institutions of the Colonies, and the history of Australian Federation. He then gives lucid explanations of the various chapters and clauses of the Commonwealth Act, the nature and authority of the Federal Commonwealth, and its "Constitution," which follows the plan of that of the United States in the distribution of the functions of Government—legislative, executive, and judicial—to three separate departments. The legislative powers of the Parliament, and the relation of the legislative authorities, i.e., The Imperial Parliament, the Commonwealth Parliament and the State Parliament, are also clearly shown. The volume is a valuable contribution to the literature on the subject, and will doubtless become a standard work of reference.

SPOTTISWOODE & CO. LTD. (London, 1902.) *The Stock Exchange Official Intelligence for 1902.* Edited by the SECRETARY OF THE SHARE AND LOAN DEPARTMENT. 21st year. By authority of the Committee of the Stock Exchange. Sm. 4to., 9" x 8": cxliii + 2,000 pp. (Price, 50s.) This well-known work requires no recommendation, as it occupies the highest place as an authority on financial matters connected with British, American, and foreign securities. The statistics and information contained in this edition have been carefully revised and brought up to date, and the system of arrangement successfully adopted last year has been continued. This present volume includes a special article entitled "Local Taxation in England and Wales," which, besides setting out the conclusions of the Royal Commission, contains a review of the existing system of local taxation, and will be found a trustworthy guide by those who desire to make themselves more fully acquainted with a subject which intimately concerns every rate-payer. The notes which it is now customary to supply upon the legal decisions of importance during the year will be found in the article headed "Company Law in 1901"; the National Debts of the World, Colonial Finance and Development, Indian Finance, Municipal and County Finance, and British Railways are also fully dealt with. The number of Companies regarding which particulars are furnished is larger than ever, though the bulkiness of the volume has not been increased owing to the admirable way in which its compilation has been carried out.

THE COPP, CLARK COMPANY, LIMITED. (Toronto, 1901.) *A Manual of the Constitutional History of Canada from the earliest period to 1901.* By Sir J. G. BOURINOT, K.C.M.G., LL.D., D.C.L. New Edition, revised and enlarged. La. 8vo., pp. 246. This book was first published in 1888, but to make it as useful as possible to students it has been thoroughly revised and enlarged, and a new edition published. The author has completed to date the summary of those judicial decisions which have so far laid down important principles for the interpretation of a constitution which has evoked much learned argument in Canadian Courts and Legislatures. A chapter on the practical operations of the principles of parliamentary government in the Dominion is also added, and the text of the British North America Act, and of the amending Imperial statutes,

is given in full at the end of the book. A complete list of the many authorities, cited in the text of this volume, will also be found useful to students who wish to investigate the constitutional history of Canada in the most thorough manner.

WITHERBY AND CO. (London, 1902.) *Lean's Royal Navy List for April, 1902.* Founded and edited for 22 years by Lieut.-Col. FRANCIS LEAN, R.M.L.I. La. 8vo., pp. xxviii + 480. (Price, 7s. 6d.) This well-known publication needs no further recommendation for its usefulness to all connected with the Royal Navy, as a work of reference. It has now entered upon the twenty-fifth year of its existence, the present issue being the ninety-eighth number. As an authentic record of naval history it has attained a well-deserved reputation on account of the labour spent on its compilation. The editor now presents it as a complete "encyclopædia" of our first line of defence. Attention is specially directed to the records of the war, and meritorious services of the officers of the Royal Navy (not to be found elsewhere), and of the Royal Marines and Royal Naval Reserve; also to the details of civil appointments held by officers in the Retired Lists. In the list of ships will be found recorded the victories of famous battle-ships bearing the same name, forming an interesting record of their war services.

CITY BRANCH OF THE IMPERIAL INSTITUTE, AT 49, EASTCHEAP, LONDON, E.C.

The CITY BRANCH OF THE IMPERIAL INSTITUTE embraces:—

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8. The Institute will undertake the supply, at cost price, of translations, into any language, of trade circulars, prices-current, etc., the conversion of weights, measures, coinages, etc.

STATISTICAL NOTES.

World's Production of Gold.—The following table, taken from a statement compiled in the Statistical Branch of the Registrar General's Office, Perth, W. A., mainly from official returns, shows the World's Production of Gold during the years 1891, 1894, 1897, and 1900:—

	1891.	1894.	1897.	1900.
	Fine ounces.	Fine ounces.	Fine ounces.	Fine ounces.
AUSTRALASIA.				
Western Australia	27,116	185,298	603,847	1,414,311
Victoria	542,784	634,391	765,365	751,211
Queensland	474,921	559,896	601,060	676,058
New Zealand	237,108	209,015	230,759	338,911
New South Wales	131,654	272,314	265,592	281,214
Tasmania	35,270	53,084	68,093	74,445
South Australia	29,552	33,616	28,285	19,418
New Guinea	(c) 1,971	(c) 920	(c) 5,890	(c) 7,560
Total ounces	1,480,376	1,948,534	2,568,891	3,563,128
Total value £	6,288,238	8,276,846	10,911,955	15,135,206
AFRICA.				
Transvaal	688,439	1,805,000	2,743,518	348,761
Gold Coast Colony	(h) 20,743	(h) 18,079	(h) 19,963	(h) 8,944
Rhodesia	(b)	(b)	3,896	78,055
Madagascar	969	262	72	33,786
Cape Colony	114	61	37	115
Natal				(b)
Total ounces	710,265	1,823,402	2,767,486	469,661
Total value £	3,017,015	7,745,320	11,755,532	1,994,993
AMERICA.				
United States	1,604,840	1,910,813	2,774,935	3,829,897
Canada	45,022	54,605	291,582	1,257,862
Mexico	(c) 58,437	(c) 78,996	(c) 435,475	404,749
Columbia	167,952	139,949	(h) 107,736	135,462
Guiana, British	85,241	109,308	102,579	110,738
Do. French	41,686	134,278	62,115	68,353
Brazil	21,187	107,349	58,251	77,407
Chili	19,281	47,435	36,383	82,447
Venezuela	44,342	49,712	30,347	(h) 15,208
Peru	22,103	29,471	29,471	38,581
Guiana, Dutch	15,717	20,874	24,273	23,544
Central America	7,909	22,762	22,535	31,446
Bolivia	3,247	3,241	16,617	15,723
Argentina	8,698	4,300	6,661	2,112
Ecuador	(b)	3,311	6,430	5,805
Uruguay	4,545	768	1,929	1,560
Newfoundland	(b)	(b)	(b)	3,950
Total ounces	2,150,207	2,717,172	4,007,319	6,104,844
Total value £	9,133,499	11,541,813	17,022,009	25,931,729
EUROPE.				
Russia	1,118,845	1,218,063	1,074,186	1,117,120
Germany	78,027	102,851	89,410	98,046
Austria-Hungary	41,586	90,078	100,446	(i) 105,036
Italy	9,131	11,220	10,160	3,643
Sweden	3,523	3,010	3,643	2,845
United Kingdom	3,225	3,487	1,691	13,352
Norway	311	45	32	74
Total ounces	1,254,648	1,428,754	1,279,568	1,340,116
Total value £	5,329,406	6,068,961	5,435,259	5,692,451
ASIA.				
China	214,376	(h) 480,847	(h) 298,486	266,086
India	120,737	187,755	350,473	443,143
Korea	36,265	(h) 21,990	(h) 48,385	(h) 85,529
Japan	22,548	25,553	33,385	60,474
Federated Malay States	(b)	10,359	24,694	15,423
Dutch East Indies	2,455	3,122	5,619	20,867
Burma	(b)	(b)	766	783
Total ounces	396,381	729,626	761,808	892,305
Total value £	1,683,719	3,099,254	3,235,954	3,790,270
THE WORLD.				
GRAND TOTAL—				
Fine ounces	5,991,877	8,647,488	11,385,072	12,370,054
Value £ sterling	25,451,877	36,732,194	48,360,709	52,544,649

(b) No return for these years.

(c) Year ended 30th June.

(h) Amount exported.

(i) Hungary alone.

SCHOOL OF MODERN ORIENTAL STUDIES.

Founded by the Imperial Institute in union with University College and King's College, London.

In 1887 it was suggested that a school of Modern Oriental Studies should be organized as a branch of the Institute, in imitation of the very efficient establishments of this kind which are carried on, with Government resources, in France, Germany, and Austria. The promulgation of this proposal led to negotiations with the authorities of University College and King's College, London, which resulted in their co-operation with the Institute in the establishment of the School. A Special Committee having been appointed to decide upon a system of work, it was arranged that classes for instruction in the Oriental languages required by students qualifying for examinations for the Indian Civil Service, should be held at University College, while modern Oriental languages, other than the Indian languages, should be taught at King's College, and that the Imperial Institute should undertake the general administrative and financial work. The School was officially opened in January, 1890, when an inaugural address was delivered by Professor Max Müller at the Royal Institution, in the presence of His Royal Highness the Prince of Wales. The daughters of the late Colonel W. J. Ouseley (Bengal Army) have established and endowed, in his memory, three scholarships, in Arabic, Persian, Hindustani, and other Oriental languages, in connection with the School, each one of the value of not less than £50 per annum. The following Scholarships have already been awarded:—

YEAR.	SUBJECT.	EXAMINERS.	AWARDED TO.
1892	Arabic .	{ Dr. WELLS Prof. SALMONÉ	No Competitors.
1893	Arabic .	Dr. WELLS	Mr. HENRY LEITNER, junr.
"	Persian .	{ Mr. JOHN T. PLATTS MIRZA HUSSEIN KULI KHAN	Mr. E. DENISON ROSS.
1894	Hindustani .	Mr. JOHN T. PLATTS	No Competitors.
"	Persian .	Dr. ROBERT BRUCE	Mr. DIWAN TEK CHAND.
"	Chinese .	Sir THOMAS WADE	No Competitors.
1895	Turkish .	Dr. WELLS	Mr. L. STENNETT AMERY.
"	Hindustani .	Mr. J. T. PLATTS	Mr. ASGHAR ALI.
"	Chinese .	Mr. W. A. PICKERING, C.M.G.	No Competitors.
1896	Burmese .	Gen. R. D. ARDAGH	Mr. LEE AH YAIN.
"	Arabic .	Dr. WELLS	Mr. H. G. SARWAR.
"	Marathi .	Mr. J. W. NEILL	Mr. V. R. PANDIT.
1897	Gujarati .	Dr. S. A. KAPADIA	Mr. RUSTUM D. N. WADIA.
"	Persian .	Mr. J. T. PLATTS	Mr. P. S. PATUCK.
"	Chinese .	Mr. W. A. PICKERING, C.M.G.	No award.
1898	Bengali .	Prof. J. F. BLUMHARDT	Mr. B. C. GHOSH.
"	Turkish .	Dr. WELLS	Lieut. A. M. SETON, R.A.
"	Chinese .	Mr. W. A. PICKERING, C.M.G.	No Competitors.
1899	Arabic .	Dr. WELLS	Mr. G. A. KHAN.
"	Persian .	Dr. ROSS	Mr. R. M. DAVIS.
"	Sanskrit .	Prof. C. BENDALL	Mr. S. K. GHOSH.
1900	Hindustani .	Mr. J. T. PLATTS	Mr. N. HAGOPIAN.
1901	Marathi .	Prof. J. W. NEILL	Mr. J. R. MARTIN.

An OUSELEY SCHOLARSHIP of £50, tenable for two years, will be awarded this year, should sufficient merit be shown, for proficiency in PERSIAN. No person will be admitted to competition for a Scholarship in a language which is his own mother tongue, nor for a Scholarship in a language allied to his mother tongue.

The examination takes place early in July, 1902.

Competitors must give notice on or before July 1, 1902.

The ages of Candidates are to be above 17 and under 25 years on January 1 of the year of examination.

Further particulars may be obtained from the Secretary, S.M.O.S., Imperial Institute, S.W.

GENERAL INFORMATION FOR INTENDING STUDENTS AT THE SCHOOL.

The classes which the "School of Modern Oriental Studies" comprises, are divided under two heads.

DIVISION I. includes classes for all Oriental Languages especially required by Students qualifying for examinations for the Indian Civil Service, the instruction being of the same character as that provided for some time past at University College and at King's College. This Division includes instruction in Sanskrit, Bengali, Hindi, Hindustani, Tamil, Telugu, Punjabi, Pali, Marathi, Gujarati, Arabic, and Persian.

DIVISION II consists mainly of classes for Modern Oriental Languages other than the Indian Languages.

The courses of tuition are of a practical rather than of an academic character; they have particular reference to commercial and official requirements and to the facilitation of colloquial intercourse with natives of Oriental Countries.

It is in contemplation, so soon as the number of students warrants the expenditure, to secure the services of native readers and teachers of conversation in connection with the classes of this Division.

The classes under this Division are conducted at King's College, where arrangements will also be made for the establishment of evening classes.

The Languages taught in Division II. comprise Colloquial Arabic, Armenian, Modern Greek, Colloquial Persian, Russian, Turkish, Chinese, Burmese, Japanese, Malay, and Swahili.

Arrangements have been completed by the Managing Committee and approved of by the Governing Bodies of the Imperial Institute and of the two Colleges, for the pursuit of studies relating to the history, literature, commercial and physical geography, political economy, and the natural and industrial resources, of the countries and districts in which the various languages are used.

Special Lectures or courses of Lectures will be delivered from time to time, in connection with the School, by experts or specialists, in any of the foregoing subjects.

There are three terms, of about ten weeks, in each year, as follows:—

SPRING TERM—commencing about the middle of January.

SUMMER TERM—commencing early in May.

AUTUMN TERM—commencing about the middle of October.

A fee of THREE GUINEAS per term will have to be paid, in advance, by each Student for each Language taken up for instruction. This payment will entitle the Student to the use, within the College, of text books, dictionaries, and works of reference required in connection with the particular Language taught, and to the use of all the facilities which it is proposed to secure in the development of the School.

Accommodation is provided at the Imperial Institute to enable Students to pursue their studies at hours when the classes are not held. The Libraries of both Colleges will be open to Students in any of the classes of the School, during the usual hours of study.

Intending Students should communicate with the Secretary at the offices of the Imperial Institute, London, S.W., where the registration of Students will take place, and where all information regarding the School will be supplied.

Rubber Forests.—Lord Cromer, in a recent report to the Foreign Office, states that considerable quantities of rubber trees are reported in many of the districts of the province of the Bahr-el-Ghazal. Mr. Broun, the Director of Woods and Forests, has been despatched to report on the possibilities of re-opening the india-rubber trade of the Bahr-el-Ghazal, which, in former days, was one of the principal sources of revenue of that district. It is also hoped, in the near future, to develop the rubber forests in south-western Kordofan, which, from all accounts, are of great importance.

Indian Cotton Trade.—The cotton industry of India, especially the mills in Bombay and the district started to employ native industry, are, says the *Drapers' Record*, in a very bad way, and there is an earnest appeal being made from India to England, now that the Budget shows a surplus of over four millions sterling, that the excise duty of five per cent. on local manufactured cotton should be at once taken off, in accordance with official promises made at the time of its imposition. There is now over nine millions sterling invested in Indian mills employing native labour. Twenty of them are in liquidation, and, for the last three years, hardly one of them has paid a dividend, or even earned the necessary legal amount to be set aside for wear and tear, and depreciation of machinery.

The Mining Industry of New South Wales.—The Under-Secretary for Mines has, so far, completed his compilation of the statistics of the past year's work in the State of New South Wales as to admit of advance particulars being given, some of which are of general interest. The total yield of gold for the year 1901 was 267,061 oz., equal to 216,888 oz. fine, valued at £921,282, as compared with 345,650 oz. (281,214 oz. fine) valued at £1,194,521 for the year 1900, a decrease of 78,589 oz. and £273,239 in value. This is the lowest yield recorded since 1894, but is in excess of any yield previous to that year back to the year 1875. A number of satisfactory and payable returns are recorded from dredging operations, but the year's operations have shown that some of the holdings on which plants were erected before a proper examination of the ground was made have proved unsuitable for dredging, and work has consequently been abandoned. The gross value of the metallic contents of the silver, lead, and zinc ores raised is not at present available, but the declared net value of the silver, lead, and zinc exported during the past year was as follows:—Silver, silver-lead, and ores, £1,854,463; lead (pig, etc.), £100,501; zinc (concentrates), £4,057—a total value of £1,959,021, showing a decrease of £828,429 on the value of the output for the year 1900. The most gratifying feature during the past year was the sustained activity in the coal trade. The quantity of coal raised during the year was 5,968,426 tons, valued at £2,178,929, being an increase of 460,929 tons, and £510,018 in value over the previous year, and is the largest output yet recorded.

MONTHLY COMMERCIAL AND INDUSTRIAL SUMMARIES.

GENERAL COMMERCE AND INDUSTRY.

British, Belgian and American Locomotives.—The comparative merits of British, Belgian and American locomotives in Egypt form the subject of a report by the Earl of Cromer in a Parliamentary paper just issued. The report was supplied at the request of the Foreign Office in answer to Sir Alfred Hickman's question in the House last May as to the consumption of fuel in the American and Belgian locomotives in use on the Egyptian railways. Lord Cromer says that it cannot be doubted that the main reason why so many orders for railway and other plant required in Egypt have recently been given to America is that American firms have been able to execute them with extraordinary rapidity. Discussing the results obtained at recent trials between locomotives of various types, Lord Cromer says:—"The general conclusion to be drawn from these trials is, I think, that, in respect to price, British manufacturers can well hold their own in cases where special designs have to be executed; that, in respect to quality, the work they turn out is at least equal, and often superior, to that of American or Belgian competitors; and that, in respect to the consumption of coal, they have decided superiority over American, though not, apparently, over Belgian manufacturers. The British weak point is the time required for executing orders. It is to this subject that I venture to draw the special attention of all who may be interested in the matter. I am not competent to express any personal opinion as to the extent to which it would be possible or desirable to imitate the Americans in adopting the principle of standardisation, on which the low prices and quick delivery of the American manufacturers mainly depend."

COLONIES.

British Central Africa and the South African Customs Union.—The Blantyre Chamber of Agriculture and Commerce has been very carefully considering whether British Central Africa should or should not join the South African Customs Union, if the opportunity is afforded it. The one argument against the step seems to be the assertion that the effect would be to increase the cost of living in British Central Africa by 50 per cent., a statement which has been received by the Blantyre paper—the *Central African Times*—as a very extreme exaggeration. This authority points out that if the growing of produce is stimulated in British Central Africa, and more of the household commodities consumed there, such as jams, manufactures, and so on, are imported from South Africa, the benefits accruing will far outweigh any additional cost due to the import tariff of the Customs Union. British Central Africa is essentially an agricultural country, and, in the opinion of the Blantyre paper, it is even a coffee country. Meanwhile a tariff wall is being built up around it. In addition to the colonies already included in the Union, it is only a question of time when Rhodesia will join, and it is understood that Portuguese East Africa has been invited to take part in the prospective conference on the subject. The present Portuguese, German East African, and Congo Free State tariffs are said to be prohibitive enough, and hence it is argued that if British Central Africa remains isolated as regards Customs arrangements, the only open market for her produce is likely to be London. South Africa offers the nearest and best market, and, continues the Blantyre paper, "were we in the Union we would not only benefit by being free from the duty, but also by preferential rates on the Government railways. South Africa as a market for coffee, tobacco, mealies, and other products is certain to expand very much in the near future, owing to the large access of population which it has received, and will continue to receive, in consequence of the war. Increased traffic with South Africa would mean lower freights, and consequently higher profits." Moreover, it is added, a large amount of money would be kept in the country, as there would no longer be any reason for sending to Denmark for butter, or to Switzerland for milk, and it would be "an easy matter" to produce tea, sugar, flour, and other commodities of a like nature in British Central Africa. The community would benefit by increased exports, the transport companies would have increased traffic, trade would again flourish, and the natives would share in the general prosperity.

Hæmatite Iron in Johore.—A correspondent of *Iron and Coal Trades Review* reports the discovery of what shows, by an analysis, to be a high grade hæmatite iron in the south-eastern part of Johore. This hill or small mountain rises to a height of 700 feet, and iron shows on the surface from base to top. This solid outcrop is, approximately, 400 feet wide by 2,000 feet long, and lies between Sungei Asah and an unnamed creek. There are several open cuts at the base of the hill that show solid ore in the face; these trenches are sufficient to demonstrate that the quantity of ore is great. This ore can be loaded on steamers or sailing vessels at small cost, and, could one find a market, there would be no trouble to ship as much as 500 tons a day. With regard to sampling, the correspondent says that he has taken the poorest ore he can find, and the results are as follows:—The ore consists of hæmatite, with a little earthy matter or gangue. On analysis, it gave iron, 68.20 per cent. This shows the ore to be nearly pure oxide of iron, and of an excellent quality.

North Queensland and Army Remounts.—With reference to the proposals which have been made from time to time for the establishment of purchasing and remount depôts in Australia, a correspondent of the *Times* makes some suggestions with reference to North Queensland, which he feels confident would, if carried out, not only give a valuable impetus to horse breeding in those parts, but would, in a short time, furnish the military authorities with a class of remount equal to any in the world. In the first place, the Government representatives should contract directly with the breeders for a supply of horses at a fixed rate of purchase, and make contracts, say, for ten years, or even a longer period, if the number of horses desired is large. Breeders take an interest in their horses, and, once rid of the one-man contractor, would enter into competition with each other to secure more extensive contracts. At about £10 to £12 North Queensland could supply horses of a class above the animals now delivered in India at £40 to £50.

To enable the Remount Department and their agents to deal directly with the breeders, it would be advisable that they should secure land in North Queensland for the establishment of depôts. Good and suitable land could be rented from the State at about 2d. per acre. If such a depôt or depôts were established on the North Queensland Railway, the Remount Department could keep their selections for a year at a cost not exceeding 10s. per annum per horse. They could then break them to any desired extent and dispose of any misfits either by sale or by arrangement with the original breeder. Thus at the end of the year the officials responsible for the depôts would have broken horses which had been trained for the last week to take "hard" food, of an excellent class, ready for shipment, at about £16 per head. It is hardly necessary to point out the advantages which North Queensland possesses for the shipping of horses.

The present time would be most advantageous for starting the scheme, even if it were only upon experimental lines.

Owing to the recent droughts, the supply of sheep and cattle is much reduced, so that the number of horses on the stations is far above the present requirements, and this in itself, if a certain market was in sight, would be an inducement to the Queenslanders to take to breeding seriously.

Western Australia.—EXPORT TRADE.—The February number of the *Monthly Statistical Abstract of Western Australia* gives the preliminary figures of the value of the most important articles of export in 1901. The following table gives a comparison with 1900:—

	1900.	1901.
Gold specie	£1,750,763	£2,807,841
Raw gold	3,799,116	3,941,797
Wool	270,718	378,135
Timber	458,461	572,354
Hides and skins	74,902	86,559
Pearls and shells	106,607	130,730
Sandal wood	39,038	73,931
Copper	33,937	110,769
Tin	57,050	52,102

FOREIGN COUNTRIES.

Demand for Fruit in China.—An American report says that the Chinese appetite for fresh fruit is strong, and apples are in great favour; the only obstacle to the creation of a large market is the inability of the masses to purchase. The average Chinaman does not distinguish the different varieties of apples, and if inferior grades could be sent at low rates, an extensive outlet could be created. Northern routes are the best for shipping green fruits. All shipments of apples for the northern ports of China should be sent by 1st October, on account of the danger of freezing if they arrive late in the season. If the fruit reaches North China in good condition, it will keep well, on account of the dry, cold climate. The presence of Russians in Vladivostok, Port Arthur, and Dalny will increase the market for apples.

Italian Chamber of Commerce in Bucharest.—The principal members of the Italian colony in Bucharest recently held a meeting at which it was resolved to establish an Italian Chamber of Commerce in the chief city of Roumania, and a committee of three members was formed to draw up the rules of the corporation. One of the first proceedings of the new Chamber will be the formation of a sample depôt of Italian goods suitable for export in Bucharest.—*Handels Museum.*

New Peat Briquette Process.—A briquette process for peat has been developed in Germany by G. Heine, and is being exploited by Mr. Hugo Krupp, of Hanover, Germany. The process will be of interest to those persons in this country who are watching developments in this industry. A large part of the expense of most peat handling processes, is the labour involved in cutting the peat from the bog and transporting it to the factory for treatment. In the Heine process, a portable centrifugal pump dredger is used to excavate the peat from the bog, rotary cutters being used on the suction pipe, so that the peat is reduced to a pulp. This pulp with about fifteen times its volume of water is carried by a pipe line to the briquetting factory. The pump's suction is so protected that stones and roots cannot enter, and sand and clay fall to the bottom of the bog. At the peat factory the peat pulp is delivered into a vat, from which it passes to a centrifugal separator, which extracts the bulk of water. The peat then passes to a cylinder press, which operates on a principle similar to that of a paper-making machine. Here the peat becomes a thin sheet which is carried by belt conveyors to a drying cylinder. These reduce the moisture to 15 or 30 per cent., an amount sufficient for briquetting. The peat, now a hot powder, is automatically fed to the briquetting machine, and is submitted to a pressure of about 2,000 atmospheres. The bituminous parts of the peat act as a cement and the product is hard coal-like clean briquette. Analyses of these briquette show, in percentage—carbon, 52.5; hydrogen, 4.8; oxygen, 22.1; ash, 9.0; water, 11.6. This corresponds in heating value to 4,850 calories per kilogram, as compared with 5,500 calories for ordinary coal, and 3,000 for wood. By carbonising the peat to a greater degree, the heating value may be increased. One metric ton of these briquette in Germany, is said to cost from 5s. to 7s. to produce, according to the size of the plant. A plant for producing 50 tons per day is said to cost £16,000.

Russian Chamber of Commerce in Alexandria.—At the instigation of the Russian Consul in Alexandria a Russian Chamber of Commerce was established there in January last, although there were already in existence, an Austria-Hungarian, English, French, Italian and Greek Chamber of Commerce. If, however, the amount of Russian trade with Egypt is taken into consideration, the establishment of the Chamber of Commerce is perhaps fully justified. The most important Russian exports to Egypt consist of raw products which are indispensable—principally petroleum, then wood for building purposes, flour, wheat and sugar. In a similar way the exports from Egypt to Russia consist of indispensable cotton produce for Russian textile manufactures—and different kinds of vegetables in small quantities. It is, however, not to be anticipated that much extension of business will be caused, as there is practically no real Russian colony in Alexandria, there being only five Russian commercial firms, the heads of which, with the Consul as president, form the Chamber of Commerce. No subscriptions are required and the expenses of the Chamber are paid by the Consul.—*Handels Museum.*

United States.—MANUFACTURES.—Some highly interesting figures are given in the *Census Bulletin of Manufactures* issued by the United States Government. The total gross value of products of manufactures, including Custom work and repairing, was given as \$13,040,013,638 in 1900, though it is pointed out that this total represented to some extent a duplication of products, owing to the fact that the finished products of many manufacturing establishments become the materials of other establishments in which they are further utilized and again included in the value of products. The net value of products of manufactures, after deducting the value of materials purchased in a partially manufactured form, is put at \$8,388,409,055. The total capital invested in manufactures in 1900 amounted to \$9,874,664,087. This was an increase of 51.3 per cent., as compared with 1890. Again comparing with 1890, the average number of wage-earners represented an increase of 25 per cent.; the amount of wages paid, an increase of 23 per cent.; the cost of materials used, an increase of 42 per cent.; and finally, the total value of produce, an increase of 39 per cent. Following are a few statistics illustrating the leading groups:—

	No. of wage-earners.	Total wages.	Value of product.
Textiles	\$682,978	\$219,229,265	\$966,924,835
Iron and steel	226,161	122,710,193	835,759,934
Slaughtering	68,534	33,457,013	786,603,670
Lumber and timber products	283,260	104,640,591	566,832,984
Flouring and grist mill products	37,073	17,703,418	560,719,063
Smelting and refining	24,504	15,973,626	358,786,472
Liquors	44,417	28,005,484	340,615,466
Boot and shoe factory products	142,922	59,175,883	261,028,580

LABOUR MARKET. COLONIES.

The following is the monthly report, up to 17th April last, compiled by the EMIGRANTS' INFORMATION OFFICE: **Canada.**—This is the best season for emigration to Canada. There is a good demand for competent men and boys who understand farm work and looking after stock, for female servants on farms and in towns, and for a limited number of carpenters, bricklayers, iron and steel workers and miners. In British Columbia the shingle manufacturing industry is very busy, and many new mills are being erected.

Australasia (New South Wales).—At Sydney the building trades have fallen off; the engineering trade is fairly well supplied with work, and there is a good demand for engineers; local shipping is good, and wharf labourers are well employed; plumbers are in very strong demand, especially for sanitary work; and there is a large demand for female servants. In mining districts there is a good demand for miners at collieries, but not at silver or gold mines. In country districts there is a good demand for farm labourers in the season, but the drought—which has now lasted some years—has seriously affected the demand for all kinds of country labour. At Young there is a good demand for bricklayers, carpenters, blacksmiths and female servants. At Orange and Jerilderie the only demand is for female servants. The cost of living has generally increased in the State, owing to the new tariff. A considerable number of men are being employed by Government on relief works. (**Victoria.**)—The hours of bricklayers have been generally reduced from 48 to 44 a week, and their wages increased from 10s. to 11s. a day. (**Western Australia.**)—The annual report of the Government Labour Bureau shows that there is a constant demand throughout the State for female servants; that mechanics—especially those in the building trades—are in demand at Perth and Northam, but not elsewhere; that there is no demand for miners on the goldfields, or at the coal mines; that labour is sometimes scarce at the timber mills; and that there is a good demand for farm labourers at 20s. to 25s. a week and board. (**New Zealand.**)—With the exception of Dunedin, where many hands have been out of work, the building trades have been busy almost everywhere, carpenters and bricklayers being especially well employed. The engineering trades have been only fairly busy, and at Dunedin many men have been out of work. The boot trade has been doing well in the smaller towns, and in Auckland good machinists are said to be scarce. The clothing trade has been, generally speaking, very busy. General labourers have been obtaining good wages at shearing, harvesting, scrub-cutting, road work, etc., but there does not appear to be any special demand for more.

South Africa.—Trained clerks from 20 to 40 years of age are wanted for service in the Army Service Corps in South Africa during the continuance of the war. Preference will be given to discharged soldiers and to single men. The pay is 5s. a day, and a free passage out and home. Candidates must present themselves to the nearest recruiting officer. (**Cape Colony.**)—There is a demand for skilled mechanics. The General Manager of the Government Railways notifies that there is a limited number of vacancies for apprentices in the large locomotive workshops at Salt River. (**Natal.**)—There has been a serious strike of several hundreds of railwaymen, on the Government refusing to raise their wages. The strikers have since resumed work, relying on the promise that their grievances will form the subject of a Parliamentary enquiry. The printers' strike has been compromised, the men accepting an extra 1s. a day, bringing the weekly wages up to 72s. The carpenters' strike continues, though about 100 men are working at the increased wage, viz., 16s. a day. There is stated to be a good demand for labour generally, especially for men in the building trades; but the great increase in the cost of food and rent—which has largely caused the above strikes—and the inability to land without a permit from the Permit Office, 47, Victoria-street, London, must be remembered by emigrants. (**Orange River Colony and Transvaal.**)—Only refugees, Government employees, and persons engaged in a service of a public nature, will be permitted to proceed to the Transvaal. Candidates for the South African Constabulary should apply to the Recruiting Officer, S.A.C. Recruiting Office, King's-court, Broadway, Westminster, S.W.; they must be good riders, good shots, single, strictly sober, and from 20 to 35 years of age; they will be given free passages to South Africa. Farriers also are wanted for this force. The number of suitable candidates for the Civil Service of the Transvaal and Orange River Colony greatly exceeds the possible number of vacancies, and no further applications can be entertained. A mounted and unmounted police force is being recruited for the towns of the Orange River Colony, but the number of local candidates is more than sufficient.

EMIGRATION AND IMMIGRATION.

* * *The Imperial Institute acts in concert with the Emigrants' Information Office (which is under the direction of the Colonial Office), of 31, Broadway, Westminster, S.W.; and also with the British Women's Emigration Association, now temporarily carrying on its work in rooms at the Institute. The Handbooks and Quarterly Circulars issued by the Emigrants' Information Office may be obtained at the Commercial Intelligence Office. Special information and practical advice respecting Canada and Cape Colony will also be furnished by the Curators of these Sections.*

UNITED KINGDOM.

British Women's Emigration Association.—The hon. secretary reports 679 applications made in the month ended April 21. The numbers of persons who embarked during this time were as follows: for South Africa, 15; Canada, 55 adults and 4 children; Australia, 11; and New York, 3.

The applications received at the London office of the Association in the Imperial Institute during the last twelve months, from persons wanting information or advice about emigration, amount to 3,851, as compared with 2,006 in the previous year. The interviews have amounted to 2,557, as compared with 1,097. Letters received, 10,337, as compared with 6,697. Letters sent, 8,658, as compared with 6,853. The increase in the desire for information has, of course, been principally with regard to South Africa. Personal interviews with applicants frequently save the colonies from the immigration of persons unsuited to their requirements, and at the same time save the bitter disappointment of failure to the individual.

In the early part of 1901, a strong and influential representative committee was formed in Cape Town called the "South African Immigration Association." Through the kindness of Mr. Rhodes and the De Beers Company, aided by some supporters in Cape Town, an admirable house was selected and furnished at Rosebank as an hostel. It was opened on May 1 by Lady Hely Hutchinson. The hostel is intended as a home where women can be received not only for a few days on their arrival, but also as boarders engaged in daily work. It is also an employment bureau for every kind of women's work.

The Bishop of Grahamstown, who takes the keenest interest in emigration work, lays great stress upon the kind of women wanted, "the best in every class, women of high character, firm religious principles, to reproduce the best traditions of the old country." It is hoped that Grahamstown will become a distributing centre for a large district. A committee is working at Durban, of which Mrs. Escombe is president and Mrs. Crofts hon. secretary. It has started a small fund, and undertakes to find rooms for a few days for travellers needing them.

A committee is being formed in Bloemfontein, but as yet no hostel has been required; should any girl need temporary shelter the Mother Superior has offered protection at St. Michael's Home, but arrangements are being made so that one will be ready by the time any considerable number of women are allowed to go out. A scheme which is being inaugurated to help trained women to start small farms on a co-operative system of their own is meeting with encouragement from those who understand the country and the difficulties in the way.

At present the temporary financial depression caused by the war renders any large development premature; but through the kindness of the Chartered Company, a hostel will shortly be opened in Salisbury, under the superintendence of Miss Dalby, where a few ladies having daily engagements, at the school and elsewhere, will reside with mission workers. The question of a hostel for Bulawayo is also under consideration. For the latter a lady of experience and ability has offered her services as superintendent gratuitously. Miss Dalby hopes to start with her mission workers early in May, and the opening of the railway between Salisbury and Bulawayo will remove many difficulties and greatly facilitate that freer circulation on which so much depends.

The special loan fund given by the Chartered Company has been of very great service to Rhodesians, and the generosity of the railway companies in granting free passes over their lines to persons recommended by the Association is gratefully recognised by all concerned.

Mrs. Wybergh was asked to establish a hostel at Johannesburg as soon as one was needed, and in September a cable was received through the Colonial Office asking for funds for this purpose. The South African Expansion Committee replied by cabling out £200 to start it. The hostel, a house in Bree-street, is already open, and receiving boarders, but owing to the difficulties in the return of refugees it cannot for a while be self-supporting.

The first call for immigrants has been for domestic servants, as there is a pressing demand for them in Johannesburg. We have already received permits for ten from Lord Milner, and they are all engaged by definite employers in Johannesburg at wages varying from £3 to £6 a month, under agreements to stay six months or a year, in most cases the passage money being withheld until the term of agreement has expired. It is hoped that before long there will be more openings for teachers, nurses, secretaries, shop-assistants, dressmakers, etc., but while the country is under martial law and permits are necessary, only a limited number can be sent out.

COLONIES.

The April circulars of the Emigrants' Information Office and the new annual editions of the penny handbooks show the present prospects of emigration, and may be obtained, free of charge, at more than 800 public libraries, Urban District Councils and institutions throughout the country.

This is the best season of the year for emigrants to go to **Canada**. Even inexperienced hands may get places, provided they are willing to learn and are strong; their wages at first will be nominal, but board and lodging will be supplied free. As a rule, single men are preferred everywhere, but married men, with wives competent to take charge of dairy or laundry, and families able to work have no difficulty in obtaining employment. Female servants also are in great demand on farms and in towns. In some parts there is a demand for miners, navvies, and general labourers. There is a good demand for men in the iron and steel works at Sydney (Cape Breton), Hamilton, Sault St. Marie, and elsewhere; and some demand throughout Canada during spring and summer for carpenters, painters, masons and others in the building trades.

In **New South Wales** the labouring classes generally are complaining of the increased cost of living, owing to the new tariff. Domestic servants continue to be in steady demand throughout the State. There are more than enough of ladies' helps, ladies' companions and governesses. The demand for female labour in such industries as tailoring and general soft goods continues, and there is a good opening for girls and women in this direction.

In **Victoria** there is no general demand for more labour, but a competent mechanic has not much difficulty in finding work. In country districts competent farm labourers and milking hands are very scarce, most men preferring the higher wages and shorter hours of the towns.

In **South Australia** there is practically no demand for more mechanics, but a skilled hand, such as a mason, bricklayer, engine fitter, blacksmith, joiner or carpenter can generally find employment after looking about for a little. In country districts there is good employment for agricultural labourers, for men able to work binders and strippers, for boundary riders, and for married couples without children for stations, but the local supply of labour is generally sufficient. There is no demand for miners.

In **Tasmania** miners and mechanics at Zeehan, Queens-town, and Gormanston, on the west coast, and in the surrounding districts are well employed; good fitters can generally get work without difficulty. In other parts of the State there is no general demand for more mechanics, but there is an opening for them if they have a little money. The supply of farm labourers is not quite sufficient, and skilled men can get work.

British East Africa.—OPENINGS FOR SETTLERS.—At a meeting of the European Colonists' Association of East Africa, held in Nairobi, Sir Charles Eliot stated that the climate was in every way suitable for European colonization. Besides the better-known parts, he thought that such comparatively distant districts as the Nandi escarpment possessed a most excellent climate, an ample water supply, and a fertile soil. He also recommended the Taru jungle. Merely nominal rents would be charged to any one disposed to try what could be done with this district. The Government would encourage settlers. Land laws were in course of preparation and would, he hoped, be promulgated within the next three months. They would probably include the grant of freeholds and be on the general lines of the regulations in force in British Central Africa. There had been proposals, he said, to settle Indians on land near the railway, but nothing further had been done, and it was not likely that Indians would be settled in the parts of the Protectorate colonizable by Europeans, but rather between Kibogoro and Kibas, near the lake, where the climate was damp and hot and more suitable for Asiatics than for white men. Mining laws would shortly be promulgated similar to those in force in Zululand. He was prepared to register at once any claim which prospectors might make to pieces of land on which minerals were found, and such claims would be dealt with under the mining laws. He had already urged the Foreign Office, he added, to establish model farms, and as soon as funds would allow of it he was sure that

the matter would receive favourable attention. It was also proposed to appoint a woods and forest department with a forester. A pamphlet will shortly be issued by the Association which will contain the necessary information required by intending settlers.

FOREIGN COUNTRIES.

German Emigrants to the United States.—The emigration from German ports to the United States, especially from Bremen, is assuming proportions far in excess of any previous records. During the first three months of this year 36,396 persons left Bremerhaven for America, against 31,347 in 1901 and 14,725 in 1898. In four years emigration has increased 147 per cent. The North German Lloyd Company are unable to cope with the rapidly-increasing stream of emigrants and are chartering ships from other companies. Over 75 per cent. of the emigrants belong to the Slavic races, and but a small portion of them can read and write. During the second quarter of this year over 60,000 emigrants, it is believed, will sail from German ports for the United States.

CUSTOMS TARIFFS.

COLONIES.

Canada.—TARIFF AMENDMENT.—With reference to the notice relating to the free entry of steel castings, in the rough, for the manufacture of scissors and hand shears, the *Canada Gazette* for 22nd March last contains an amended Order in Council dated 12th March, 1902, which provides for the addition to the list of articles which may be imported free into Canada of the following articles, viz.:—

"Malleable iron or steel castings, in the rough, for the manufacture of scissors and hand shears, when imported by manufacturers of scissors and hand shears to be used in making such articles in their own factories."

Cyprus.—IMPOSITION OF ADDITIONAL DUTY ON TOBACCO, ETC., IMPORTED IN PACKAGES WEIGHING LESS THAN 20 OKES NET EACH.—An Order in Council, dated 2nd January, 1902 (No. 348) has been issued, amending the Order in Council of 18th May, 1901 (No. 345), which provided for the imposition of an additional duty of 6d. per oke upon tobacco, cigars, cigarettes, and snuff imported through the *Parcels' Post* into Cyprus in packages weighing less than 20 okes net each.

The new Order in Council amends the Order in Council of the 18th May, 1901, by adding thereto the following clause:—

"(3) Whenever tobacco, cigars, cigarettes, or snuff are imported into the Island otherwise than through the *Parcels' Post*, under special permission from His Excellency the High Commissioner, in packages weighing less than 20 okes net each, there shall be levied and taken upon every oke or fraction of an oke of tobacco, cigars, cigarettes, and snuff so imported, in addition to the Customs duty thereon, a further import duty of one shilling."

The Customs duties imposed at the present time on tobacco, etc., imported into Cyprus are as follows:—

	s. d.
Tobacco, unmanufactured (except Tumbeki)	Per oke (2·8 lbs.) 0 6
Tobacco, unmanufactured, known as Tumbeki or Persian (including additional duty imposed under the Tobacco Law of 1899)	1 8
Tobacco, manufactured (except cigars, cigarettes, and snuff)	3 0
Tobacco, manufactured cigars	Per hundred 2 6
" " cigarettes	Per oke 5 0
" " snuff	5 0

Mauritius.—REVOCATION OF PROCLAMATION PROHIBITING THE IMPORTATION OF CERTAIN ARTICLES FROM REUNION.—A Proclamation, dated 11th March last (No. 8 of 1902) has been issued, revoking Proclamation No. 66 of the 14th December, 1900, whereby, in consequence of the existence of cattle plague in Reunion, the importation of certain articles (principally animals (dead or alive), rags, manures, plants, and vegetables) from that Island into Mauritius was prohibited.

Natal.—REGULATIONS UNDER EXCISE ACT, 1901.—The Natal Government Gazette for 25th February last contains Notices (Nos. 128, 130, and 131 of 1902), relating to regulations made by the Governor in Council, under the provisions of the Excise Act of 1901, as follows:—

1. Regulations as to methylated spirits made in, imported into, and stored in the colony.

Under these regulations it is provided, *inter alia*, that:—

"Imported methylated spirits mixed with any ingredient or substance of any description or kind, whatsoever, on being landed, must be placed in a warehouse approved by the Controller of Excise, and shall not be removed therefrom until after a sample of such spirits taken from each package or vessel as imported shall have been examined and certified by the Government chemist or other person authorised by the Minister, to contain not less than 80 per cent. of crude methyl alcohol."

2. Regulations as to the sale of methylated spirits by retail.

3. Regulations for payment of drawback of duty on rectified spirits, colonial compounds or liqueurs.

The above regulations came into force on 25th February, 1902.

New Zealand.—DECISIONS.—The following Decisions under order of the Commissioner of Trade and Customs (No. 685 of 4th March last), having reference to the Customs Tariff of New Zealand, have been received:—

Articles, and how classed.	Rate of Duty.
Corn starch and also potato-farina in casks or bags, when imported by or for a manufacturing confectioner, on declaration being made that the importation is to be used for moulding starch—	Free.
As confectioner's moulding starch	Free.
Druggists' shop-fittings, bottles for—	
As druggists' sundries (C.O. 675)	15 % ad val.
(This refers to bottles with painted labels; plain stoppered bottles are free under item No. 364).	
Fire extinguishers (Champion and Babcock)—	
As fire engines, including Merryweather's chemical fire engines	Free.
Gelatine, powdered and icing gelatine—	
As gelatine	20 % ad val.
Machinery, electric, including electric motors for mines, mining dredges or dairies—	
As machinery, electric and appliances	10 % ad val.
Manure mixer—	
As machinery for agricultural purposes	Free.
Rock drill—	
As machinery for mining purposes (C.O. 684) when supported by certificate or declaration that it is imported for mining purposes	"

Articles, and how classed.	Rate of Duty.
Sago-flour—	
As sago	Free.
Ships' segment lenses for mast-head lights	"
Tapioca-flour—	
As tapioca	"
Turbine for saw-mill—	
As machinery for saw-mills	"
Vacuum Company's mineral sperm-oil—	
As kerosene	"
"Xylolith" flooring—a mixture of sawdust and ground stone—	
As building materials, n.o.e.	"

Somaliland Protectorate.—CUSTOMS REGULATIONS.—By the Customs Regulations, dated 27th February, 1902 (No. 2 of 1902), under Article 32 of the "Somaliland Order in Council, 1899," the Tariffs are amended as follows:—

ZEYLA.

The import duty on "alcoholic liquors (except for harrar)" is as provided by Articles 1 and 2 of the "Alcoholic Liquors Regulations, 1901."

The following is the text of the Articles referred to:—

1. A duty at the rate of 2 rupees the gallon at 50 degrees centigrade shall be paid on all alcoholic liquors imported for sale or consumption in the Protectorate.

2. The said duty shall be augmented proportionally for each degree above 50 degrees centigrade, and shall be diminished proportionally for each degree below 50 degrees centigrade.

BERBERA AND BULHAR.

The export duties on mules and donkeys have been assimilated to those in force at the port of Zeyla, and are now as follows:—

Mules	8 rs. per head.
Donkeys	1 re. per head.

The present Regulations, *inter alia*, provide that:—

1. At the port of Berbera no goods (other than Government stores and goods and baggage of officials and live stock, which may be landed at the Shaab pier in the presence of a Customs officer) may be landed at or shipped from any other place than the Customs pier.

2. At the Ports of Zeyla and Bulhar all goods must be landed or shipped at the Customs pier and landing-stage opposite the Customs-house respectively.

3. No Customs duties shall be levied on goods exported from one Customs port of the Protectorate to another, except that goods exported from Zeyla to another Customs port of the Protectorate shall pay an import duty equivalent to the difference between the import duty at Zeyla and that at the port of destination.

4. All firearms, ammunition, and explosives shall be deposited in the custody of the chief Customs officer, and shall be subject to special Regulations made from time to time.

Trinidad and Tobago.—IMPOSITION OF EXPORT DUTIES FOR IMMIGRATION PURPOSES DURING 1902.—An Ordinance (No. 34 of 1901) provides for the imposition of duties, in aid of immigration, upon the following articles raised or manufactured in the Island of Trinidad and shipped for places beyond the limits of the colony during 1902:—

	Export Duties.
	s. d.
Sugar	Per 1,000 lb. 2 8
Rum	" 100 galls. 6 0
Cocoa	" 100 lb. 0 7½
Coffee	" " 0 7½
Molasses	" 100 galls. 2 0
Cocoanuts	" 1,000 0 7½
Copra	" 1,000 lb. 1 11

(And on lesser quantities in each case in proportion).

FOREIGN COUNTRIES.

France.—EXEMPTION FROM CONSUMPTION DUTY OF SALTS FOR AGRICULTURAL PURPOSES.—According to a recent circular of the French Director-General of Customs, it has been decided that the exemption from duty accorded by the Law of the 8th November, 1869, to denaturated salts intended for use as cattle food or as manure, or in the preparation of manure, applies only to exemption from the consumption tax. Consequently, imported salts intended for the uses specified can only be exempted from the consumption tax on proof that the import duty leviable thereon has been paid.

Germany (South West Africa).—REGULATIONS AS TO IMPORTATION OF ANIMALS INTO GERMAN SOUTH-WEST AFRICA.—The *Deutsches Kolonialblatt* for the 1st March contains the text of a Decree of the Governor of German South-West Africa, issued with a view to the prevention of cattle diseases in the Protectorate. The following are the principal provisions of the Decree:—

The importation into the Protectorate of animals suffering from any contagious disease is forbidden.

In the case of imported horses, donkeys, mules, binnies, cattle, sheep, goats, and pigs, the importer is required to produce the following certificates:—

(a) A certificate from the proper authorities at the place of origin, stating that no contagious diseases affecting the particular kind of animal to be imported has occurred at that place.

(b) A certificate signed by the police authorities at all the stations on the route followed by the animals up to the frontier of the Protectorate, stating that the animals have not, during transit through their districts, touched any place at which the existence of contagious disease has been proved.

(c) In the case of animals imported from Europe an additional certificate is required, showing that the animals were inoculated with tuberculin before embarkation, and that no rise in the warmth of the body exceeding 0·5 degrees has taken place.

A *précis* translation of the regulations, containing a list of the diseases declared contagious, may be seen on application at the Commercial Intelligence Branch of the Board of Trade, 50, Parliament-street, S.W., any day between the hours of 10 a.m. and 5 p.m.

Italy.—SURTAX ON EXPLOSIVES.—The Italian *Bollettino Ufficiale* for February last, contains the text of revised regulations, in virtue of which the internal manufacturing tax on gunpowder and other explosives and the surtax on gunpowder and other explosives imported from abroad are fixed at the following rates:—

Blasting powder, and powder in the form of dust, 50 lire per 100 kilograms. (£1. 0s. 4d. per cwt.).

Sporting powder, and blasting compounds other than blasting powder, 125 lire per 100 kilograms. (£2. 10s. 10d. per cwt.).

All other explosives for sporting purposes or for firearms in general, 250 lire per 100 kilograms. (£5. 1s. 7d. per cwt.).

Powder in granular form, employed in the manufacture of miners' fuses, shall be entitled to claim the return of the difference between the duty on sporting and on blasting powder.

The complete text of these regulations, in the original, may be seen by those interested at the Commercial Intelligence

Branch of the Board of Trade, 50, Parliament-street, S.W., any day between the hours of 10 a.m. and 5 p.m.

Paraguay.—TARIFF MODIFICATIONS.—H. M. Consul at Asuncion reports that the import duties leviable in Paraguay on provisions, wines and spirits, have been increased by 100 per cent., and that export duties have been increased as follows:—

On hides, by 25 cents gold (rs. 3d.) each.

On milled yerba mate, by 3 cents gold (1½d.) per 20 lb.

On unmilled yerba, by 4 cents gold (2½d.) per 20 lb.

United States.—CUSTOMS DECISIONS.—The following is a list of some Decisions affecting the application of the Customs Tariff and Regulations:—

Garnets cut and polished so as to be in a condition suitable for jewellery, are dutiable as "precious stones advanced in condition by cutting," under para. 435 of the Tariff, at the rate of 10 per cent. *ad val.*

Tuberine is held to be a description of glue, and not starch, and is, therefore, dutiable under para. 23 of the Tariff according to value.

Fish sounds, cleaned and dried are not free of duty under para. 496 of the Tariff, but are dutiable under para. 23, according to value, even though the manufacturing process may have been imperfect and the product of inferior quality.

Small circular mirrors enclosed in cheap metal coverings, including outer cases for closing the same, are dutiable as toys, under para. 418 of the Tariff, at the rate of 35 per cent. *ad val.* Similar mirrors set in tin frames, with backs adapted for holding an advertisement, are dutiable as mirrors, under para. 112, at the rate of 45 per cent. *ad val.*

Braids, etc., composed of cotton or other vegetable fibre and other materials, including such as are known as "Battenberg braids," "crown braids," "feather-stitch braids," "feather-edge braids," "guipure lace braids," "herringbone braids," "Honiton braids," "linen bobbins," "novelty braids," "renaissance braids," "rickrack braids," "star braids," "wave braids," etc., are dutiable under para. 339 of the Tariff at the rate of 60 per cent. *ad val.*

TRANSPORT AND FREIGHTS.

The Freight Market.—Outwards the position remains practically unchanged, but rates are weak at 3d. to 6d. reduction in most directions. Recent fixtures have been on basis of 5s. 9d. Genoa, 6s. 6d. Adriatic, 5s. 9d. Port Said, 6s. 6d. Las Palmas, 9s. 6d. Colombo, 11s. 6d. Buenos Ayres, 12s. 6d. Rio Americano.—The only feature has been a slight demand for grain tonnage, but otherwise there is no change in the situation. **Australian** shippers, owing to the sudden rise in the local value of wheat, are paying vessels large sums to discharge cargo already loaded and cancel their charters. **Black Sea** has been operating at 7s. 6d. Odessa berth. **Eastern** markets have declined, and current quotations are 12s. 6d. Bombay, 20s. Calcutta, 20s. Rangoon. Java began to operate at 25s., but rate has fallen to 22s. 6d. **Mediterranean** markets continue extremely dull. **River Plate** is still overloaded with tonnage, and rate is weak at 9s. from Buenos Ayres, or 12s. up-river. One or two suitable boats have secured cattle to South Africa.—WEDDEL, TURNER & CO., April 25, 1902.

COLONIES.

Canadian Northern Railway.—The Canadian Northern Railway Charter has passed the Dominion House of Commons. By it the Company is authorised to extend its line through the North-West Territory to British Columbia, north of the Canadian Pacific Railway line, *via* Pine River Pass, with bonding powers of \$25,000 per mile, and also to build eastwards to Quebec.

New Steamship Service to South Africa.—A new steamship service is about to be established between Liverpool and South African ports. It will be undertaken conjointly by two well-known Liverpool shipping companies. Messrs. T. and J. Harrison have arranged, in conjunction with Mr. J. R. Ellerman, of the Leyland line, to have regular sailings every twelve days to the Cape, the starting-point on this side being Liverpool. This additional service will not result in the reduction of freights, a friendly arrangement having been come to between the promoters of the new venture and the Clan Line, who already have regular sailings between Liverpool and South and East African ports. The question of the insufficient steamship communication between the Mersey and South Africa has recently occupied the attention of the Liverpool Chamber of Commerce. The Clan Line were approached, but they replied that there was already sufficient tonnage on the route for the cargo offering.

West Indies.—PRACTICAL SYMPATHY WITH SUGAR PLANTERS.—Messrs. Elder, Dempster, and Co. issued the following statement on the 2nd April:—

"We are very anxious to show our sympathies with the planters of the West Indies and to cultivate trade between Kingston and this country. We have, therefore, issued a circular to-day saying we are willing to carry sugar until further notice free of freight by the Imperial Direct West India Mail service from Kingston to Avonmouth."

BRISTOL AND IMPORTS FROM THE WEST INDIES.—The Bristol City Council have adopted a policy of protection in revising the sugar dues, exempting imports from the British West Indies from the increases which were resolved upon. They advanced the dues on raw sugar from 6d. to 1s. per ton, and refined sugar from 1s. to 1s. 6d. The Council agreed with the recommendation of the Docks Committee that it was inexpedient at the present juncture to alter the charges on sugars from the West Indies, seeing that Sir Alfred Jones, of Elder, Dempster and Co., had announced that liners are about to carry sugar from Jamaica to Bristol freight-free until further notice, in order to give an impetus to Jamaican trade.

FOREIGN COUNTRIES.

France.—TRADE IN EASTERN ASIA.—The French Shipping Company, known as the Société des Vapeurs de Charge is about to change its title to Compagnie Est-Asiatique. It has just purchased a Danish steamer of 8,000 tons register (the *Annam*), and is having three more boats built for the Chinese and Cochin-China coasting trade. This Company contemplates creating a regular steamship service between Copenhagen, Antwerp, Dunkirk, Marseilles, Singapore, Port Arthur, and Vladivostok.

Mexico.—VERA CRUZ HARBOUR.—The new harbour works at Vera Cruz were inaugurated with great ceremony on the 6th March by the President of the Mexican Republic, the Governors of several of the States, and representatives of many foreign Powers. Vera Cruz has hitherto suffered from the great drawback of not affording shelter for vessels in the winter season against the northerly storms which rage in the Gulf of Mexico, and which are familiarly termed "northerners." When one of these storms arose the only chance of safety for ships in the harbour was to instantly seek the open ocean. It may be remembered that during one of these "northerners" in 1851 thirteen vessels came to grief in Vera Cruz harbour. At that time, also, there were no proper facilities for landing cargo, and goods and

passengers had to be put on shore by means of either lighters or boats. It was not until 1882 that any serious efforts were made to remedy this state of things, but even then the work of improvement only proceeded in a very half-hearted manner, until, in 1895, S. Pearson & Son, Limited, of London, took up the contract for completing the harbour works which had been planned, and then the operations commenced in earnest. The improvements are now completed at a cost of thirty million pesos, and these, it is claimed, have changed Vera Cruz into the safest and most commodious harbour in the Gulf of Mexico; offering a secure shelter at all times for vessels of any size, even during the prevalence of the dreaded "northerners."

The works which have accomplished this welcome change consist, in the first place, of two substantial breakwaters, one on the north-east side and one on the south-east side of the harbour entrance—1,823 and 913 metres in length respectively—leaving an opening at the sea ends 260 metres in width. Behind the north-east breakwater a dam 50 metres in length is built, reaching to the Castle of San Juan de Ulua, and two other sheltering dams or dykes—500 and 635 metres in length respectively—having a quay-width of 10 metres, have been formed to provide an anchorage ground for small craft. The great City Quay is nearly two miles long, and stretches from the front of the north-east breakwater to the north side of the south sheltering dam. The piers for ocean vessels run out at right angles from the City Quay, and are numbered from 1 to 12. The Government pier is 180 metres long and 22½ metres wide. There is also another quay 380 metres in length and 100 in width. Connected with this last-mentioned quay are eight railway lines, and here also are four warehouses and a number of electric and hydraulic cranes. Seven large vessels can lie at this quay at the same time, and take or discharge their cargoes direct from or into the railway trucks. The depth of water alongside is 10 metres at ebb tide. For the passenger traffic a special station is set apart on the City Quay, alongside which steamers can lie, and here is also a Custom-house for the examination of passengers' luggage and an office for the quarantine officials. Trains run direct from this pier into the town and to the railway stations. Altogether the new works just completed have made of Vera Cruz a safe and commodious harbour, fitted with the most approved modern appliances.—*Fairplay*.

Russia.—The Russian Government has concluded a contract with the East Chinese Railway Company for the maintenance by this Company, for a period of ten years, of a regular steamship service between Vladivostok and the Sea of Ochotsk. Four voyages must be effected every year, and the first boat must leave Vladivostok after the opening of navigation not later than the 23rd May. Several ports have to be called at in these voyages.

OFFICIAL AND COMMERCIAL CONTRACTS. UNITED KINGDOM.

Biggleswade.—TENDERS are invited until the 30th inst. for CONSTRUCTING A WELL. Particulars (£2. 2s.) may be obtained from G. F. Deacon, 16, Great George-street, Westminster, or from the Clerk to the Water Board, Biggleswade.

Burton-on-Trent.—TENDERS are invited by the Corporation for reconstructing bridge, Horninglow-road, over Trent and Mersey canal: (1) BRICKWORK; (2) STEELWORK. "Fair wages" clause. Particulars, £1 deposit, from Mr. G. T. Lynam, borough engineer, till the 5th inst.

London.—TENDERS are invited, until the 13th inst., by the WEST HAM CORPORATION, for:—Two STEEL CHIMNEYS, four FANS and ENGINES for INDUCED DRAUGHT, all brickwork in connection with flues, and economisers (one contract). "Fair wages" clause. Particulars (£5 B.E. note deposit) may be obtained from Mr. J. K. Bock, borough electrical engineer, Abbey Mills, West Ham, E.

Rochester.—TENDERS are invited by the Corporation, until the 15th inst., for the supply of c.i. pipes. Supply of 2,875 lin. yds. c.i. SOCKET PIPES, 20 SLUICE VALVES, and 15 HYDRANTS. Forms and specifications may be obtained from Mr. W. Banks, A.M.I.C.E., city surveyor, Guildhall, Rochester.

Selkirk.—TENDERS are invited by the TOWN COUNCIL for the supply and laying of about 1,900 lin. yds. of 9-in. c.i. MAINS (Acme i.r. joints), partly under water, with valves, etc. Also INTAKE WORKS, Howden Haugh (tank and collecting gallery). Particulars (£1. 1s. deposit) may be obtained from Mr. H. Taylor, A.M.I.C.E., St. Nicholas' chambers, Newcastle-on-Tyne; or Mr. J. Pretty, C.E., burgh surveyor.

COLONIES.

Ceylon.—TENDERS are invited by the Ceylon Government until the 14th July for the following SUPPLIES OF PAPER:—

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|--|--------|
| 1. Azure Wove Writing Paper— | Reams. |
| Quad Foolscap, 34 in. by 27 in., 55 lb. | 1,500 |
| 2. Cartridge Paper— | |
| White, Super Royal, 27½ in. by 20½ in., 50 lb. | 150 |
| 3. White Printings— | |
| i. Quad Foolscap, 34 in. by 27 in., 40 lb. | 900 |
| ii. Double Royal, 40 in. by 25 in., 44 lb. | 800 |
| iii. Gazette (special size), 35 in. by 25 in., 43 lb. | 750 |
| iv. Quad Crown, 40 in. by 30 in., 65 lb. | 400 |
| v. Double Royal, 40 in. by 25 in., 60 lb. | 50 |
| vi. Double Demy, 35 in. by 22½ in., 48 lb. | 100 |
| 4. Coloured Printings— | |
| Royal, 25 in. by 20 in., 24 lb. (Yellow 50, Blue 40, Pink 25, Green 5, Slate 5). | 125 |
| 5. Glazed Badami— | |
| i. Double Royal, 40 in. by 25 in., 32 lb., put up folded | 1,000 |
| ii. Quad Foolscap, 34 in. by 27 in., 30 lb., put up folded | 200 |
| 6. Brown Wrapping Paper— | |
| Size 29 in. by 22 in., 50 lb., put up folded | 100 |

Particulars are published in the Ceylon Government Gazette, which may be seen at the Imperial Institute.

New South Wales.—TENDERS are invited until the 5th June, for the SUPPLY of 10,000 feet of STEEL TROUGHING. Particulars may be seen at the office of the Commissioner and Principal Engineer for Roads and Bridges, Sydney, New South Wales.

South Australia.—Contractors accustomed to the execution of large marine works are notified that TENDERS will be invited at an early date for works involved in the CONSTRUCTION of an OUTER HARBOUR in Light's Passage at the entrance to the Port Adelaide River. The proposed works will comprise, approximately, 4½ million cubic yards of dredging in limestone, sand and clay, and the construction of 1,500 feet of wharfs and stone revetment walls in connection therewith for the berthing of steamships in the harbour, also the reclamation of a large area of foreshore with the dredged materials. Drawings and specifications are in course of preparation, and it is anticipated that these will be ready for exhibition to tenderers in Adelaide about the middle of April, 1902, and at the office of the South Australian Agent-General in London about the middle of May,

1902.—TENDERS are invited until the 20th inst., for the SUPPLY and DELIVERY of best IRON CRANE CHAINS, viz.:—5 cwt., short link, 1½ in.; 10 cwt., 1½ in.; 10 cwt., 1½ in.; 15 cwt., 1½ in.; 10 cwt., 1½ in.; 10 cwt., 1½ in.; 5 cwt., 1 in.; 10 cwt., 1½ in. Particulars may be obtained at the Supply and Tender Board Office, Adelaide.

INDIA.

East Indian Railway.—TENDERS are invited, until the 30th inst., for the SUPPLY and DELIVERY of (1) Steel Material, (2) Wrought-iron Material, (3) Spring Steel and Steel Wire, (4) Picks, etc., (5) Canvas, etc., (6) Canvas and Indiarubber Hose and Sheeting, (7) Wrought-iron Gas Tubing, (8) Grindstones. Particulars (Nos. 1 to 7, 21s each; No. 8, 10s. 6d.) may be obtained at the Company's offices, Nicholas-lane, E.C.

State Railways.—The Secretary of State for India in Council invites TENDERS, until the 6th inst., for the SUPPLY of LOCOMOTIVES, 5 ft. 6 ins. gauge. Particulars may be obtained from the Director-General of Stores, India Office, Whitehall.

FOREIGN COUNTRIES.

Belgium.—TENDERS are invited, until the 13th inst., by the National Company of Local Railways, at No. 14, Rue de la Science, Brussels, for the construction of the section of the line from Itegem to Santhoven. The upset price of the work is 206,012 francs (£8,240), and a deposit of 20,000 francs (£800) is required. Particulars (1 franc = 10d.) may be seen at the Company's office, and at the office of M. de Masy, No. 17, Rue Milis, Antwerp.

Netherlands.—The Government invite TENDERS, until the 7th inst., for the supply of the following material:—CONTRACT No. 294.—109 sets of wheels and axles for railway carriages. 295, 296, 297.—Springs and other appurtenances for railway carriages. 298.—35 frames with 3 axles, Cleminson system, for railway carriages. 300.—Various appurtenances for railway carriages. 301.—Ironwork for tanks, cranes, etc. LXII.—Mild steel. Particulars may be obtained from Mr. Mat. Nyhoff at the Hague, on payment of 1 fl. (1s. 8d.) for each of the contracts Nos. 294, 295, 296, 297, and LXII.; 3 fls. (5s.) for No. 301; 4 fls. (6s. 8d.) for Nos. 298 and 300.

Norway.—TENDERS are invited, until the 6th inst., for the supply of 1,550 metres "Moquette" stuff for railway carriage seat covering, and 1,380 metres curtain woollen stuff, of various qualities. Particulars may be obtained at the office of the Director, Engineering Department, Christiania.—TENDERS are invited by the Aalesund Municipality, until the 20th inst., for (1) about 16,000 metres 8-in. cast-iron pipes tested to a pressure of 520 lb. per square inch, except about 2,000 metres which are guaranteed tested to only half that pressure. (2) About 350 metres 9-in. cast-iron pipes, tested to 280 lb. (3) About 1,800 metres 5-in. cast-iron pipes, of which 800 metres tested to 460 lb., and the rest to 280 lb. (4) About 20 8-in. stop valves. (5) Three irregular castings, such as basin lids ("kummelaag"), branch boxes, bends, branches, etc. (6) About 20,000 kilogs. soft block lead—sample block to be sent. Particulars may be obtained from J. S. Solem, town engineer, Aalesund, Norway.—TENDERS are invited until the 12th inst. for the SUPPLY of 6,000 RIFLE STOCK PIECES OF WALNUT to the Kongsberg Arms Factory.—TENDERS are invited until the 13th inst., for the SUPPLY of 80 TRUCK TARPULINS. Particulars may be seen at the offices of the Director of the Engineering Department of the State Railways in Christiania.

Portuguese West Africa.—TENDERS are invited, until the 19th inst., for the CONSTRUCTION of a METAL PIER, to be used as a quay in the harbour of Sao Thomé.

Spain.—TENDERS are invited until the 26th inst., for the SUPPLY of 108,000 reams of WHITE PAPER of the second class, known as "de tina." Particulars may be seen at the "Direccion General del Timbre del Estado," Madrid.

COMMERCIAL LAW INTELLIGENCE.

A Point in Insurance Law.—In the Court of Appeal the case of the BRITISH WORKMAN'S AND GENERAL ASSURANCE CO., LTD. v. CUNLIFFE was considered on a special case stated by the justices of Leigh, Lancashire, and the question was whether the respondent Cunliffe could recover from the appellants £5. 16s., premiums which he had paid in respect of the life of his brother-in-law. The policy was effected through one Bibby, formerly an agent of the appellants. The justices found that the life on which the policy had been issued was one in which Cunliffe, who was a collier working at Leigh, had no insurable interest, but that the company, through Bibby, had represented that the policy would be valid and effective in law, and that the respondent relied on the representation, and was entitled to the return of the premiums. The Divisional Court upheld the decision of the justices, and the company appealed to this Court. At the conclusion of the arguments, Lord Justice Vaughan Williams said he was clearly of opinion that the money paid by Cunliffe under the circumstances could not be allowed to remain in the appellants' hands. Bibby had represented to Cunliffe that it would be "all right," and that representation, though an innocent one, was made by a man skilled in insurance matters to a person who was wholly ignorant of law, and naturally believed the truth of the statement. The appeal therefore failed. Lords Justices Romer and Mathew concurred, and the appeal was accordingly dismissed with costs.

Trade Union Law.—Mr. Justice Walton gave judgment at the Glamorganshire Assizes at Cardiff in the case of GIBLAN v. THE AMALGAMATED LABOURERS' UNION of Great Britain. The plaintiff sued Mr. Williams, general secretary of the union, and Mr. Toomey, the district secretary, for damages, in that they had "unlawfully and maliciously conspired and procured his employers to break their contracts, and to discharge him from their employment, and further that they had induced certain workmen to refuse to work with him, and to threaten to leave their employment if he continued to do so." The trade union, under the Taff Vale decision in the House of Lords, was joined as a defendant. The jury awarded the plaintiff £100 damages. The point of law reserved was as to whether the acts of Williams and Toomey rendered the funds of the union liable. It may be pointed out that this is the first case in which a trade union has been sued in a court of law. Mr. Justice Walton, in giving judgment, said a trade union was a collective name for a number of persons acting by certain persons in concert. It was not a corporation, but a body of individuals who had agreed to act in concert for the attainment of specific objects, which were defined by its rules. The action by which the plaintiff was injured was either that of the union, acting in concert through its authorised agent, or the action of Williams and Toomey. Assuming that the union was responsible for the acts of its co-defendants, the members of the union, acting in concert through their agents, prevented plaintiff from obtaining employment by refusing to work for employers who employed him. Having regard to previous decisions, he did not think this would be an actionable wrong if it were done for the

purpose of protecting or advancing the interests of the union. On the other hand, having regard to the case of *Quin v. Leathan*, it would be actionable if done directly for the purpose of injuring the plaintiff. Applying this principle to the present case, it seemed that the union secretary's object was to punish the plaintiff for not repaying the money he had misappropriated. If Williams did this within the limits of his authority as secretary, there would be judgment for the plaintiff against the union and the two other defendants. But the question was whether Williams was acting within the limits of his authority. If he committed a tort in doing something not within his authority at all, even though he purported to be acting for the union, his act could not be deemed to be an act by the members of the union. After considering the rules of the union, he (the judge) held that Williams had done something outside the limits of his authority, and therefore the union was not liable. There would, therefore, be judgment against Williams, and for the union and the defendant Toomey.

Shipping.—The frequent question of when a ship has arrived in a port arose in the case of *MODESTO PINIERO & Co. v. DUPRE & Co.* The plaintiffs were the owners of the s.s. *San Salvador* and let her to the defendants by a charter-party dated November 3, 1900, to proceed to Santander to a loading-place as ordered, and there load a cargo of iron ore and proceed to Maryport and there unload. The *San Salvador* arrived at Santander on November 18, 1900, and was ordered by the defendants to the new tip, five miles up, where she did not arrive until December 6, 1900. The plaintiffs brought this action for demurrage, claiming that the lay-days began on November 18, 1900. The defendants, on the other hand, contended that the lay-days did not begin until December 7, 1900, when the ship was ready at the loading-place to which she was ordered by them. Mr. Justice Kennedy gave judgment for the defendants, and said that in his opinion the ship was not an arrived ship until she reached the loading-place to which she was ordered in the port of Santander. The charter-party did not order her to go to Santander only, but to a loading-place as ordered in that port.

Railways and Traders.—An important decision was given by the Court of Appeal on s. 76 of the Railways Clauses Act, 1845, in the case of *THE LANCASHIRE BRICK AND TERRACOTTA COMPANY (BAXENDEN), LTD., v. THE LANCASHIRE AND YORKSHIRE RAILWAY COMPANY.* That section provides that owners of land adjoining railways and any other persons may lay down collateral branches to communicate with railways, and obliges the railway companies at the expense of such persons to make openings in their rails to effect such communication, but such openings need not be made where they would interfere with any specific purpose of the company, nor on any inclined plane or bridge, nor in any tunnel. A later section, s. 92, allows anyone to use the lines with properly constructed engines and carriages. The applicants, the Lancashire Brick, etc., Company, carried on business near Baxenden station and had an agreement made in 1894 with the railway company which provided for the laying down of sidings by the railway company. This agreement contained a clause limiting the right of user of the sidings to the applicants. Afterwards the applicants let part of their land to a chemical manufacturer, who used the sidings for his traffic. The railway company then gave notice determining the agreement, and removed the connections. The applicants then applied to the Railway Commissioners (Mr. Justice Wright, Sir P. Peel and Lord Cottenham), under s. 76 of the Railway Clauses Act, 1845, for an order upon the railway company to make a connection and sidings and afford reasonable facilities for traffic. The Railway Commissioners gave judgment in favour of the applicants. The railway company then appealed to the Court of Appeal, and contended that s. 76 had no real operation now because it was impossible for persons other than themselves to use the line. They also argued that a gradient of 1 in 98 where the connection was asked for, constituted an "inclined plane" within the meaning of s. 76. The Court of Appeal reversed the decision of the Railway Commissioners, and the Master of the Rolls said that the applicants had not the right claimed; s. 76 was passed when a railway was considered to be a form of highway.

BRITISH CONSULAR REPORTS.

Holland (Amsterdam).—The Consular report on the trade and navigation of the port of Amsterdam for the year 1901, states that business, on the whole, has been less profitable and satisfactory than in 1900. The shadow of the war in South Africa has hung over all minds, and there has been a general disinclination to engage in large operations. Moreover, the increasing tendency of all trades towards co-operation and syndication has not encouraged individual enterprise, and the whole course of commerce and industry there, as elsewhere, is gradually adopting new channels. The labouring classes were, on the whole, much less restless than in the previous year, and there have been but few strikes of any importance. Up to the commencement of the winter there was no great complaint of want of employment, but for some weeks before the close of the year there has been an increase in the number of the unemployed, and the outlook at present is not entirely satisfactory. On the other hand, there has been hitherto no exceptional distress, and employment in many branches of industry has been well sustained.

Shipping, in common with this branch of trade in all other countries, has suffered from a severe reaction in the course of the past year, and is still in a very depressed state. Dear coal and greatly reduced freights have brought profits down to a minimum for the most favoured lines, while many vessels, especially those of the adventuring class, are being run at a loss. There is a great scarcity of goods for transport, and the very large steamers which have been constructed of late find a difficulty in filling up with cargo, and this naturally leads to great depression in rates of freight. The Baltic timber trade, in which many Dutch vessels find employment, has especially suffered in this respect, and a diminution of in some instances 30 to 40 per cent. in rates has not been uncommon. Nor are the prospects for the ensuing year at present by any means encouraging, though the cost of coal has fallen already to a normal figure, good coal being now obtainable at 16s. 6d. to 17s. free in bunkers. As regards the shipbuilding and generally the iron manufacturing industries of this country, the past year was busy and fairly prosperous. Several steamers were built in this country for the Netherlands commercial fleet, and a still larger number are under construction, while considerable orders have been entrusted to British builders. In the iron industry the demand for machinery from several quarters has been increasing, and the prospects for the present year are encouraging in many respects. The construction of electrical machinery of all sorts, and that of electrical rail and tramways, and of the required rolling-stock, will give a new spur to this branch of industry. Existing horse tramways are being rapidly converted into electrically worked lines, and the necessary buildings and machinery for the supply of this motive-power are being pushed forward in many places. Automobiles, propelled by electric-power, steam, or petroleum, have

not as yet been introduced into the Netherlands to so considerable an extent as in neighbouring countries, but there is a gradually increasing demand.

Portugal (Lisbon).—WINE TRADE.—The latest report issued by the Foreign Office from the British Attaché at Lisbon states that the wine trade in Portugal is passing through a period of serious depression, owing to the super-abundant production and the large stocks of wine that cannot be placed on the market. Although many enquiries are received about various classes of cheap light wines suitable for ordinary use in England, little progress has been made in bringing them to the knowledge of the public. To place a new class of wine on the market requires considerable enterprise, and might be undertaken by well-known firms who can supply their regular customers with samples for trial. If this were done, and the prejudice against unknown articles of consumption were overcome, there can be no doubt that these light wines would have a ready sale in England. The manufacture of good cheap wine in Portugal has only been seriously undertaken during the last few years, so that it is quite natural that it should be still unknown outside the country. Portugal is admirably suited to the growth of vines, so the production of wine is always out of all proportion to the demand. Up to 1886, the Portuguese wines, with the exception of port wine and Madeira, were only used to supply the requirements of the country and for export to the Portuguese colonies, Brazil, and to the French wine factories. The wine was manufactured of the finest grapes, but mixed with inferior potato alcohol, without technical knowledge, without proper apparatus or cellars for storage, and under the necessity of immediate sale in order to pay the expenses of the vintage. It was natural that there was no demand among consumers in Europe for this class of wine.

Of recent years, however, the production of good sound wine of the nature of claret and hock is rapidly increasing, and now that care is taken in its manufacture, the flavour and quality are excellent, and the wine is in many ways superior to other wines to be obtained at the price. The increase in this trade is much to be wished for by both countries, as it would supply an article of necessity in the United Kingdom to the benefit of the consumer and merchants, and would encourage a new and important trade between the two countries which would create a favourable influence on general business relations. The total annual exportation of port wine has declined during the last six years, but still amounts to 275,314 hectolitres, valued at 5,739 contos of reis (£889,500).

In spite of the rivalry among wine-producing countries, the prospects of the port wine trade in the United Kingdom are as good as ever. Although habits have changed as regards wine drinking, the taste for port wine has spread through all classes of the population, and instead of only being drunk by well-to-do people, there is now a large sale of port wine at bars and restaurants. Although it is feared that much of this cheap port wine does not come from Oporto, this new class of consumer will largely compensate the port wine trade for any loss of former customers, and while the choicest wines can be reserved for good cellars, the cheaper quality will meet with an increasing demand. The port wine trade has been such a valuable support to British industry in Portugal during the last century that it would be a serious loss to British trade in general if the wine should decline in popular favour. The Madeira wine trade does not show any great fluctuations, and has somewhat increased of late years. The output is limited, and the trade can never be very important. The United Kingdom, Russia, France, and Germany are the best customers. The numberless foreign wines of the same description as Madeira tend to reduce the prices, but the best qualities still command high prices, and are as much in demand as ever.

United States (Charleston).—In a recent report on the trade of Charleston and district for the year 1901, it is stated that probably no portion of this country has attracted wider attention or the investment of more outside capital, during the past year, than has that section south of the Pennsylvania line and east of the Ohio and Rio Grande rivers. The development there of its mineral resources has been large, with greatly increased operations in prospect for the future, and it is difficult for one not in touch with the business to form a just idea of what has actually been done last season or is now in course of preparation. No State in the Union is more favoured by nature in the extent and diversity of its mineral products than is West Virginia. Her coal deposits embrace all grades of bituminous, coking, steam and gas coal of the best qualities. West Virginia contains more of the Appalachian coalfield than any other Southern State. The total area comprises about 16,000 square miles, more than 80 per cent. of the total bituminous areas of Ohio and Pennsylvania combined, 60 per cent. more than Pennsylvania alone, and 2,000 square miles more than Tennessee and Kentucky combined, the section underlain by coal being about two-thirds of the area of the State. The total product of the Virginia mines was about 25,000,000 tons last year, compared with 22,647,207 tons in the previous year. After West Virginia the greatest coal State in the South is Alabama, the output of which for 1901 is estimated by the coal inspector to be 10,000,000 tons net, as compared with 8,400,000 tons during the previous year. The Alabama coal business is divided into three distinct branches, namely, the production of coal for coke-making and industrial use at or near the point of production; the supply of coal for locomotive use throughout the country; and also the supply of coal for domestic use and steam-making purposes in communities that are situated near the mines.

The production of coal in the State of Tennessee has increased from 2,092,064 short tons in 1892 to 4,200,000 tons in 1901, a considerable portion of the product having been mined by convict labour in mines owned and worked by the State. In the mining districts many new enterprises are being developed and much new work, it is expected, will be done next year. Coal-mining in North Georgia has been carried on to a limited extent, comparatively speaking, for a number of years, principally by convict labour, the convicts being hired from the State; the Georgia output is very generally used for domestic and steam-making purposes, for which it is well adapted, but high railway rates have restricted its distribution to a limited extent of territory; experiments are, however, being made at Savannah by the New York coast steamers, with the view of ascertaining if Georgia coal cannot be profitably used for bunker purposes by ships from the first-named port. No exact figures have yet been obtainable as to the output of coal in either Georgia or North Carolina during the past year; the quantity, however, is somewhat limited in character in both States. Kentucky is a large coal producer, the tonnage having increased from 3,025,313 tons in 1892 to 5,000,000 tons in 1901. Maryland's product is about the same as the State of Kentucky, her output having increased from 3,419,962 tons in 1890 to 5,000,000 tons in 1901. Arkansas is also coming forward as a coal State; her product in 1901 was 1,447,945 tons, while the estimate for last year is 1,750,000 tons. An interesting feature of last year's reports has been the growth of the coal-mining industry as a consequence of railway extensions in West Virginia, Kentucky, Tennessee and Arkansas, and also of canal work done and improved terminal facilities at Mobile, Pensacola, New Orleans, Savannah, Newport News, and Norfolk.

FOREIGN CONSULAR REPORTS.

Commerce of Mexico.—The City of Mexico is the capital of the country and the commercial centre; being the railroad centre, it is the distributing point for the rest of the Republic; being the banking centre, the bulk of the financial transactions of the Republic pass through it. Much of the agricultural and mining business, and some of the manufacturing business of the rest of the Republic, are directed from this city. The most important single line of trade, and that which shows the largest amount of imports, is in machinery and machinery supplies. This is practically controlled by Americans. The hardware trade, which is a good one, is largely in the hands of Germans, though in the past few years American hardware has been making deep inroads into the German imports in this line. While the large hardware stores are run by Germans, all of them now carry large lines of American hardware. The dry-goods trade, which is next in importance after the machinery trade, was controlled early in the last century by the English and later by the Germans, but it is now controlled by the French. The grocery trade is controlled by Spaniards, and their monopoly of this line is almost absolute. There appears to be no large field for imports of American groceries in Mexico, the demand being mostly from resident American and a few Mexicans who have lived for some time in the United States. The figures for the year ending June 30, 1901, show a very unsatisfactory year's business for Mexico. Imports increased over the preceding fiscal year \$3,765,275, or 5·8 per cent., while the total exports show a slight falling off. A glance at the export figures, however, shows a decline of \$7,395,186 in vegetable substances, and an increase of \$7,047,419 in mineral substances. Most of this increase is due to the exportation of gold and silver bullion, which is a net loss to the nation's resources. Thus the actual decrease in exports amounts to nearly \$14,000,000. Encouragement is to be found in the falling off of certain imports, such as dry-goods, indicating an enlarged home supply. While imports from the United States show a large increase, those from almost every other country exporting to Mexico—except Germany—show a large decline. Imports from the United States gained \$4,138,838, or 11·8 per cent., while the total increase in imports amounted to only \$3,765,275, or 5·8 per cent. In other words, while the imports from the United States show an increase of \$4,138,838, the imports from the rest of the world show a decrease of \$373,562. Imports from the United States amounted to 54·3 per cent. of the total imports, as compared with 50·6 per cent. in the preceding year.

IMPORTS FROM GREAT BRITAIN show a decrease of \$558,565, or 5·3 per cent., from the preceding fiscal year. It is known that the greatest falling off in any one line is in dry goods, particularly cotton textiles. The value of cotton textiles imported from Great Britain during the year may be roughly estimated at \$1,200,000, as compared with \$2,100,000 during the preceding year, a decrease of nearly one-half. Importations of railway iron and steel for the last fiscal year amounted to about one-third of those during the preceding year, or, roughly, about \$188,000 as compared with \$585,000. Importations of galvanized fell from about \$490,000 in the fiscal year 1899-1900 to about \$290,000 in the fiscal year 1900-1901. Importations of linen textiles fell from some \$190,000 in the fiscal year 1899-1900 to \$135,000 during the fiscal year 1900-1901. In cotton textiles a remarkable falling off is noted in prints and bleached cottons. The decrease in importations of cotton and linen textiles from Great Britain during the past few years is due in great part to the rise of native cotton and linen manufacturing industries.

The East Indian Papaya.—The papaya tree flourishes all over tropical India, from Delhi to Ceylon. Its fruit is greatly prized by both European and native, as well for its edible as for its medicinal qualities. Botanically, it is of the passion flower family, and is termed *Carica papaya*. The tree grows very quickly, and bears fruit within a year from first putting down the seed. It bears fruit all the year round, and in great numbers. It seems to thrive best in a hot, moist climate. The fruit, when ripe, attains to the size of a small melon, which it somewhat resembles. While growing, it has a deep green colour, which, on ripening, turns to a dull orange. The interior is soft, yellowish, and sweet, and contains numerous small black seeds, arranged in five longitudinal lines along the centre cavity. They have a pleasant, pungent taste, and are not unlike mustard seed. The ripe fruit has a flavour peculiar to itself. It is eaten by all classes, and is considered wholesome. In the West Indies it is sometimes boiled and eaten as a vegetable. In India, when green, it is cooked by the natives in their curries, and is also pickled. It is usually, however, eaten raw, when ripe, with salt, and is ranked among the finest of eastern fruits.

CHEMICAL AND MEDICINAL QUALITIES.

The properties of the tree to which particular attention is drawn are its remarkable chemical and medicinal qualities. Many of them are known to the profession in America, but they are more especially known to the native Hindoo, who, in his unique village life, has extracted from the vegetable kingdom many of its valuable secrets.

THE JUICE.

The fruit, particularly in the early stages, secretes a white, milky, viscid juice, of the consistency of cream, which has the extraordinary property of hastening the decay of muscular fibre exposed to its influence. It has an energetic action upon nitrogenous substances, and, like pepsin, will curdle milk. It is more efficacious than pepsin in dissolving albumen.

PAPAIN.

The active principle has been separated and given the name of papain, and is used for medical purposes. This active principle, so analogous to pepsin in its physiological properties, may be obtained by adding alcohol to the juice of the unripe fruit, which causes a precipitate, which, when dried and powdered, is ready for use, and called papain. The whole tree abounds in this juice, which is remarkable as containing fibrine, a principle otherwise found only in the animal kingdom. The celebrated chemist Vanqueline compares this creamy juice to blood deprived of its colouring matter. The resemblance between this juice and blood is indeed striking. In its peptonizing power it is superior to ordinary animal pepsin, having the peculiar additional advantage of not requiring the aid of an acid nor an alkali to convert the contents of the stomach into peptone.

CHEMICAL PROPERTIES.

Tough or fresh meat of any kind dipped in water containing a few drops of the juice, or boiled in water impregnated with the juice, will become in a few minutes quite tender. A simple way to prepare meat is to wrap it in the leaves of the papaya and then roast it. In a tropical climate like India meat requires to be cooked quickly, in order to prevent rapid decomposition, and consequently is usually found tough.

COSMETIC.

The juice is used as a cosmetic to destroy freckles on the skin caused by the sun's heat, and to remove ink stains from the hands. The fruit and juice have several other medical properties that have long been recognised by the Hindoo pundit, and lately have been receiving the attention of chemists and the medical profession.—*United States Consular Report.*

CHAMBERS OF COMMERCE REPORTS.

UNITED KINGDOM.

Leeds.—At the monthly meeting of the Leeds Chamber, held on 25th March, the chair being taken by the president (Mr. G. R. Portway), correspondence was submitted from the Butter Association with reference to the fixing of a standard of moisture in butter. The Board of Agriculture had fixed a limit for water in butter, but had exempted milk-blended butter, and thus, it was alleged, the door was left open to fraud. Mr. Ward said that if liquid were put into butter it was, to a certain extent, a fraud upon the public. The admixture of milk was an addition of water, because the principal constituent of milk was water. A resolution was passed condemning the sale of milk-blended butter, and urging the Board of Agriculture to fix a standard of moisture for butter, which would apply to milk blending.

A long letter was read from the China League respecting the changes proposed to be made in the import duties on goods entering China, and the promise made that, in compensation for an increase of some 15 per cent. on the import duties, the internal taxation on merchandise should be abolished. The consistent bad faith of the Chinese Government, and the rooted antipathy of successive British Governments to intervention on behalf of their nation in China, were important facts in considering the matter. It might be postulated with some degree of certainty that the policy of the Chinese officials would remain in the future pretty much what it had been in the past, and while the system of government remained what it was in China there was no reason to suppose that the exemption of foreign goods from an illegal taxation would be any more effectually secured under the new treaty than under the old, unless material guarantees were secured. Alderman Wurtzburg thought that in the interests of British trade with China support should be given to the action which the China League was taking in the matter. Mr. Matheson said that even if China got the extra duties she would not abandon the Likin duties, because the central Government had not sufficient control over the Mandarins to bring about such a reform. Mr. Henry Barran agreed that it would be impossible for the Chinese Government to carry out any such reforms at present, at any rate in an enduring form. It was decided to support the China League in the matter.

Mr. F. W. Tannett-Walker, who was one of the deputations from the Association of Chambers of Commerce to the Postmaster-General on the subject of the telegraph system, made a report as to the proceedings. He said that there was an idea that an underground line should be taken to Scotland *via* Preston, but he was able to extract an assurance from Lord Londonderry that the line should go through Leeds. He thought the Department had made up its mind to construct an underground line, and that the work would be quietly pressed forward irrespective of whether the Chancellor of the Exchequer could or could not afford to give large doles from the public purse towards this work.

Liverpool.—At a recent meeting of the committee of the African Trade Section, Sir Alfred Jones, K.C.M.G., chairman of the section, presiding, it was reported that the memorial of the Chamber on the subject of the concessions in the French Congo had been circulated to certain Chambers of Commerce abroad, whose assistance in the matter had been invited. The Bremen Chamber of Commerce had now replied, saying they thought that a meeting of the signatory powers to the Berlin Act of 1885 should be summoned to consider how the terms of the Act had been complied with. The committee expressed themselves strongly in favour of the suggestion, and recommended that the proposal of the Bremen Chamber should be brought to the notice of Lord Lansdowne. The following letter has accordingly been sent to his lordship:—

"My lord,—I am directed to draw your lordship's attention to the memorial on the above-named subject, addressed to you by this Chamber on the 30th September, 1901, and especially to the last paragraph thereof, in which it is urged that immediate steps may be taken to enforce the Act of Berlin of 1885, if the above-named concessions are found to be an infringement of that Act.

"I am to inform you that this Chamber has been in communication with several Continental Chambers of Commerce on the subject, and that the Bremen Chamber has suggested to the German Government that the signatories to the Act of Berlin should be re-assembled in conference to consider the manner in which the terms of the Act have been observed. I am to say that the committee of the African Trade Section strongly approves of the suggestion, and trusts that your lordship and His Majesty's Government will give it their support.—I have, etc. (Signed) THOMAS H. BARKER, Sec.

The following statement was laid before the committee by a member of the section:—"It may interest the West African Committee to know that we have recently received a report from Cape Coast that the judges are declining to issue certificates of validity in respect of dredging concessions over the beds of rivers, and, as we understand it, this applies whether the rivers are tidal or non-tidal. In declining to issue certificates they refer the matter to the Government, the inference being that the chiefs who have purported to grant concessions have no right to do so, but that the title over beds of rivers is in reality in the Government. Under English law, except where there has been a royal grant, the bed of a tidal river does not belong to private individuals, but where it is non-tidal the owners of the land on either side have full rights over the bed to the middle of the stream. It seems clear that the chiefs from time immemorial exercised seigniorial rights over the beds of rivers.

"From a purely legal point of view it appears to us that it is an interference with the native rights; on the other hand, we think there can be no doubt, from a practical standpoint, that it would be beneficial for the Government to take over the titles, and we assume that they would compensate the chiefs by giving them a certain proportion of the rent."

It was resolved to bring the matter before the notice of the Secretary of State for the Colonies, and to ask him whether the information given in the foregoing statement is correct.

Sir Alfred Jones announced that Mr. Chamberlain had recommended the Governor of Lagos to abolish the dues charged there on goods in transit to Porto Novo, and that the dues in question would be abolished accordingly. The committee expressed much gratification with the statement of the chairman, and wrote to thank Mr. Chamberlain for his action in the matter.

After the meeting, the sub-committee appointed to consider the Forestry Proclamation, Southern Nigeria, presented their report thereon, which was concluded and adopted.

Manchester.—An ordinary meeting of the Board of Directors of the Chamber of Commerce was held on the 9th ult., Mr. John Thomson (president) occupying the chair.

Since the last meeting of the Board, steps have been taken to ascertain the opinion of the general body of the Bombay merchants in Manchester as to certain proposed regulations for the settlement of questions arising out of the occurrence of "short length" white piece-goods. A series of resolutions on the subject, adopted by a meeting of these merchants, and afterwards revised by the India, China, and Colonial Committee, was presented in the minutes of that Committee. The Committee requested that the Bombay Chamber should be asked to

present the regulations for the acceptance of the Bombay Native Piece-Goods Merchants' Association. These read as follows:—

(1) If the number of short pieces over and above pattern-cut pieces does not exceed 10 per cent. of the total number of pieces in any one lot of bleached mulls, jaconets, nainsooks, or tanjibs, delivery shall be accepted with an allowance, in respect of shortage over and above pattern-cut pieces, calculated at the rate of the sale price. (2) If the number of short-length pieces over and above pattern-cut pieces exceeds 10 per cent. of the total number of pieces in any one lot of bleached mulls, jaconets, nainsooks, or tanjibs, the dealer shall have the option of returning the excess over the 10 per cent. short in such lot. (3) If the number of short-length pieces over and above pattern-cut pieces does not exceed 15 per cent. of the total number of pieces in any one lot of bleached shirtings, delivery shall be accepted with an allowance in respect of shortage over and above pattern-cut pieces calculated at the rate of the sale price. (4) If the total number of short-length pieces over and above pattern-cut pieces exceeds 15 per cent. of the total number of pieces in any one lot of bleached shirtings, the dealer shall have the option of returning the excess over 15 per cent. short in such lot. The word "lot" is defined as meaning those goods or that instalment of goods which, in the terms of the contract, are to be shipped or delivered in any one specified period. The Board adopted the regulations, and ordered that a letter should be addressed to the Bombay Chamber, as desired by the India Committee.

A letter received from the Imperial Department of Agriculture for the West Indies (Barbadoes), accompanied by six samples of cotton grown in that island, was laid before the Board. The samples were of various kinds, five of them having been grown from American seed. The Department asked to be informed of the value of the cottons. It was stated that much interest is being taken in cotton cultivation in several of the West Indian Islands, and that many experiments are in course of progress. Information was desired as to the advisability of endeavouring to promote the commercial cultivation of cotton in the West Indies. It was resolved to submit the samples and the letter to the Committee recently appointed at the instance of the Oldham Chamber, to consider the question of the extension of the growth of cotton.

GENERAL INTELLIGENCE OF THE PAST MONTH.

April, 1902.

UNITED KINGDOM.

APRIL 1st: The King visited the Royal National Hospital for Consumption at Ventnor. The Lord Mayor entertained the boys of Christ's Hospital at the Mansion House. Death of General W. C. Forrest, C.B.

2nd: The King, accompanied by the Princess Henry of Battenberg and her children, visited Carisbrook Castle. The Prince and Princess of Wales left London for Copenhagen. The sixth meeting of the National Directory of the United Irish League was held in Dublin.

3rd: At a special meeting of the Dublin Corporation, Mr. J. Redmond, M.P., and Mr. P. A. McHugh, M.P., were presented with the honorary freedom of the City. The King left Cowes for Weymouth and visited Lulworth Castle.

4th: The King inspected the Convict Prison at Portland. A conference of tenant farmers was held in Belfast to consider the new Land Bill.

5th: The King visited Plymouth. Death of Major-General Sir John Donnelly, R.E., late Secretary, Science and Art Department, South Kensington. Euston Hall, the seat of the Earl of Grafton, was destroyed by fire. Death of Professor Meiklejohn. A serious disaster occurred at a football match at Glasgow; one of the stands collapsed and 23 persons were killed.

7th: The King visited the Scilly Isles. In the House of Commons the Licensing Bill passed the second reading.

8th: Death of Lord Kimberley in his 77th year. The Queen Victoria Memorial Fund amounted to £192,000.

9th: The King visited Penzance. In the House of Commons the Rating of Machinery Bill was read a second time. A company was formed with a capital of £5,000,000 for the purpose of electrifying the District Railway, and building and working four other underground lines.

10th: The King visited Falmouth. A memorial service was held in St. Paul's for the late Mr. Cecil Rhodes. The Irish Unionist Alliance held its annual meeting in Dublin.

11th: The King returned to Cowes. A meeting was held at the Mansion House to further the development of commercial relations between Russia and Great Britain. It was announced that 21,000 more men would be sent to South Africa. Death of Viscountess Chewton.

12th: The King returned to Buckingham Palace. Rumours of peace were in circulation. Sir E. Lawson laid the foundation stone of the new Institute of Journalists.

14th: Lord Stratheona presented to the King an address from the citizens of Montreal with a gold medal commemorating the visit of the Prince and Princess of Wales. Death of the Rev. Dr. Caleb Scott. In the House of Commons the Chancellor of the Exchequer made the Budget statement, placing duties on corn and flour.

15th: A serious accident occurred on board the battleship *Mars*. A national conference of Evangelical Free Church Councils was held to protest against the Education Bill. Death of Sir E. T. Gourley.

16th: The King left Buckingham Palace for Sandringham. Nine counties of the South and West of Ireland were proclaimed.

17th: The Prince and Princess of Wales returned to London from Denmark. Lord G. Hamilton spoke at the annual dinner of the Institution of Mechanical Engineers. In the House of Lords the second reading of the Music Copyright Bill was passed.

18th: Princess Louise, Duchess of Argyll, opened the annual exhibition of the Royal Drawing Society. In the House of Commons, the Post Office Vote was carried.

19th: Primrose day was observed in London. The French Chamber of Commerce in London held their annual banquet.

21st: The King received the Crown Prince of Siam at Buckingham Palace. The Archbishop of Canterbury presided at the annual meeting of the Church of England Temperance Society. The Lord Mayor opened the Guildhall Art Gallery Exhibition.

22nd: The King was present at the Epsom Spring Meeting. The Queen arrived in London from Denmark. The Duke of Argyll opened a British Empire Missionary Exhibition at Kensington Town Hall. In the House of Commons the corn and flour duties were adopted.

24th: The Archbishop of Canterbury presided at the annual meeting of the Society for the Propagation of the Gospel in Foreign Parts. The Alien Immigration Commission held its first sitting in Westminster.

25th: Mr. Brodrick was presented with the honorary freedom of the Broderers' Company. Lord Charles Bressford was returned unopposed as M.P. for Woolwich, and Mr. Hugh Law (N.) as M.P. for Donegal West.

26th: The King and other members of the Royal Family witnessed the Lacrosse Match at Lord's between the Toronto Club and the Duke of Argyll's team. Lord Alverstone presided at the annual dinner of the Newspaper Press Fund.

28th: The Archbishop of Canterbury presided at the annual meeting of the National Temperance League.

29th: The King left London for Newmarket. Nonconformist meetings were held in opposition to the new Education Bill.

COLONIES.

Australia.—5th: A general order was issued for raising four new battalions for South Africa, to be named the Australian Commonwealth Horse.—10th: The second reading of the Franchise Bill providing for Women's Suffrage was passed by the Commonwealth Senate. 24th: The Commonwealth adopted the principle of Imperial Penny Postage.—**New South Wales.**—19th: A banquet was given to Mr. Seddon, at Sydney.—**Victoria.**—3rd: Mr. McCulloch, Minister of Public Works, was deputed to organise the Agent-General's Office in London.—9th: Reform meetings were held to insist on reduction in the expenditure on Parliament and the public service.—**South Australia.**—2nd: The 2nd contingent for South Africa embarked.

New Zealand.—5th: The Government decided to enrol the Maoris as volunteers.—8th: Mr. Seddon was presented with a purse of £5,000 and an address in recognition of his Imperial services.—14th: Mr. Seddon left for Durban, along with 500 men of the contingent for South Africa.

British West Africa.—6th: The Aro campaign was concluded, and the contingents from Lagos and Northern Nigeria returned to their own colonies.

Canada.—3rd: The Manitoba Act, restricting the sale of liquor, was defeated by a very large majority.—8th: Lord Dundonald was appointed to the command of the Canadian Militia in succession to Major-General O'Grady Haly. The extension of the charter of the Canadian Northern Railway was approved by the Parliamentary Railway Committee.—9th: The Canadian Pacific Railway purchased the Ottawa Northern and Western Railway for \$4,500,000.—10th: Mr. Borden announced that the active militia forces would be increased to 100,000 men.—28th: The fourth contingent of 2,000 men for South Africa was completed.

Cape Colony.—1st: Colonel F. Rhodes and Mr. A. Rhodes arrived at Cape Town.—3rd: The funeral service for the late Mr. Cecil Rhodes was held at Cape Town; the coffin was conveyed by train to Rhodesia. Mr. Rhodes left in his will £2,000,000 for educational purposes and his residence, Groot Schuur as an official house for the Federal Premier.—4th: The Parliament was prorogued till August 1.—7th: Commandant Kritzing was acquitted.—9th: Skirmishes with scattered band of Boers and local rebels were reported.—28th: The trial of Princess Radziwill for forgery was begun in the Supreme Court, at Cape Town.

Fiji.—9th: Sir H. M. Jackson, Governor of the Leeward and Island, was appointed Governor and Commander-in-Chief.

Jamaica.—2nd: The Government abandoned its new taxation plan, as part of the community refused to pay.—4th: Rioting occurred at Montego Bay. Troops and a cruiser were sent to suppress the rioters.

Leeward Islands.—9th: Sir G. Strickland, Chief Secretary at Malta, was appointed Governor.

Natal.—1st: The northern districts were strongly protected by blockhouses; a portion of the troops from India were sent up country.—15th: A Bill was introduced into Parliament creating a burgher force and establishing universal compulsory service.—23rd: The Burgher Bill was withdrawn.

Newfoundland.—15th: The Premier announced that he had secured the entry of Newfoundland fish into Portugal on the same terms as Norwegian fish.

Rhodesia.—8th: The train conveying the remains of Mr. Cecil Rhodes arrived at Bulawayo.—10th: The body of the late Mr. C. Rhodes was interred in the Matoppos.—24th: It was reported that Mr. R. Williams had been granted a concession for a railway from the northern frontier of Rhodesia to Lake Kasali, Congo Free State.

Orange River Colony.—8th: De Wet's brother, Piet de Wet, was authorised to raise another burgher corps for the Colony.

Transvaal.—1st: The Boers under Delarey and Kemp were utterly routed near the Hast River and dispersed; the Canadian Rifles greatly distinguished themselves.—2nd: The Boer delegates succeeded in communicating with Mr. Steyn.—6th: It was reported that Caspar Kruger had taken the oath of allegiance. The total number of Boers in the field was estimated at 8,000.—7th: Lord Kitchener reported that Commandant Erasmus had been killed near Boshof.—9th: The Boer leaders held a conference with Mr. Schalk Burger, Mr. Reitz, and the other peace delegates at Klerksdorp. Increasing numbers of native labourers arrived on the Rand.—12th: The members of the Boer Transvaal "Government," with Generals Botha, Delarey, and De Wet and Mr. Steyn, arrived in Pretoria.—13th: Colonel Colenbrander captured the greater portion of Beyer's laager.—18th: The Boer delegates and leaders left Pretoria to confer with the burghers in the field as to terms of peace.—22nd: Mr. Reitz and Mr. Jacobs left Balmoral for Pietersburg to meet Commandant Beyers.

INDIA.

3rd: The number of persons on famine relief was reported to be 395,000.—5th: An agreement was made for the preservation of order among the Mahsud tribesmen.—8th: News was received that a party of Punjabi rifles had been ambushed by a gang of outlaws near Joi Khula.—15th: The number on famine relief was 359,000.—17th: The question of the Berars was settled, the Nizam relinquishing all territorial claims, and receiving thirty lakhs annually in lieu of surplus revenues.—19th: Lord Curzon arrived at Delhi to inspect sites and plans in connection with the Coronation Durbar in January next.—26th: Lord Curzon held a durbar of chiefs and representatives of the North-West Frontier Province of Peshawar, and explained the policy of the Government towards the frontier tribes.

FOREIGN COUNTRIES.

Argentine Republic.—2nd: The Government decided to purchase two additional warships at a cost of £2,000,000.—13th: The Government accepted the tender of the Creusot Company to build a harbour at Rosario at a cost of 53,000,000 fr.—**Austria-Hungary.**—9th: Count von Bülow arrived in Vienna.

Belgium.—9th: Socialist disturbances took place in Brussels, Liège, and Ghent; troops were called to arms.—10th: The Socialists demanded universal suffrage. The rioting increased.—12th: Further riots were reported in Brussels.—14th: A general strike of workers commenced.—23rd: Work throughout the country was resumed.

Chili.—9th: The Chambers were opened.

China.—1st: Russia agreed to withdraw from Manchuria within eight months.—4th: The Chinese internal postal system

was greatly improved.—8th: The amended Manchurian Convention was signed at Peking.—12th: The allied commanders resolved that the Provisional Government of Tien-tsin should be maintained until the forts were destroyed. The rebellion in Kwang-si continued to make head.—14th: Prince Tsai-chen, son of Prince Ching, was appointed special ambassador to King Edward's Coronation.—29th: The Emperor, the Empress Dowager and the Court returned to Peking. The agreement for restoring to China the Peking-Shan-hai-kwan railway was signed.

Denmark.—8th: King Christian's 84th birthday was celebrated.—19th: The Landsting passed a resolution that the sale of the Danish West Indies should not take place unless the electorate of the islands voted for it.

France.—6th: M. Clémenceau was elected to the additional senatorship devolving on Var by the death of M. Denormandie.—7th: Mr. Doumer, the retiring Governor-General of French Indo-China, arrived at Marseilles.—28th: The general elections resulted in a great success for the Ministry.

Germany.—2nd: It was announced that the German Emperor would be represented at King Edward's Coronation by Prince Henry of Prussia. Dr. Kuyper, the Dutch premier, arrived in Berlin.—19th: Death of Prince Henry XXII. of Reuss.

Holland.—18th: It was announced that the Queen was ill with typhoid fever.—23rd: The Queen was reported to be recovering.—28th: The Queen continued to make satisfactory progress towards convalescence.

Italy.—2nd: The 11th International Peace Congress was opened at Monaco.

Norway.—16th: The Ministry resigned.—20th: A new Cabinet was formed by M. Blehr, who will hold the portfolio of the Interior and the Premiership.

Persia.—5th: It was reported that a concession to work the oil beds of the Kirkhah had been granted to a British subject.

Philippines.—13th: Major Waller was acquitted of the charge of killing natives of Samar.

Russia.—4th: The new Four per cent. Loan was subscribed for more than 100 times over in Germany, Holland, and Russia.

—10th: The Roman Catholic Archbishop of Vilna was deprived of his see.—15th: M. Spiaguine, Minister of the Interior, was assassinated.—22nd: General Vannovsky, Minister of Education, resigned.—24th: It was reported that the population of Finland offered great resistance to the new army regulations.

Serbia.—5th: The peace footing of the Serbian Army was raised to 17,500 men. Dr. Popovitch, Minister of Finance, resigned.—6th: M. Milanovitch became Financial Minister in addition to holding the provisional charge of the Department of Commerce.

Spain.—5th: The Bank of Spain protested against the Bill relating to the fiduciary circulation.—17th: Death of Don Francisco d'Assisi, ex-King of Spain.

Switzerland.—1st: The new palace of the Swiss Parliament was opened at Berne.—10th: Diplomatic relations with Italy were suspended.

Turkey.—12th: Bulgarian bands continued to commit outrages in Macedonia. Fresh troubles were reported in Albania.—22nd: The Arab rebellion in Yemen was reported to be spreading.

United States.—5th: It was announced that the New York Chamber of Commerce would invite the Prince of Wales to attend the ceremony of dedicating the Chamber's new building in August next.—11th: The death of General Wade Hampton was announced.—13th: Death of the Rev. Dr. de Witt Talmage in Washington.

Venezuela.—8th: News was received that the Government forces had severely defeated the revolutionists twice.—18th: Diplomatic relations with France were renewed.—24th: A Government force was reported to have been defeated by the revolutionists near San Antonio, and General Castillo killed.

FORTHCOMING EVENTS.

UNITED KINGDOM.

Kingston-on-Thames.—On the 17th inst. the millenary of the Coronation of Edward the Elder will be celebrated.

London.—On the 7th inst. Mr. Albert Chancellor, J.P., as Master of the Coachmakers' Company, will read a paper at the Society of Arts on "The Origin and History of Carriages." On the same date the annual meeting of the Iron and Steel Institute of Great Britain opens. Institution of Civil Engineers, Westminster (two days).—On the 8th the annual dinner of the JAPAN SOCIETY will be held, the Japanese minister in the chair.—On the 9th the PRINCE OF WALES will be installed as Chancellor of the University of Wales, at Bangor.—On the 12th the KING will hold a LEVÉE at St. James's Palace at noon.—On the 14th the annual general meeting and the annual dinner of the NAVY LEAGUE will be held.—On the 22nd the King and Queen will be present at the opening of the Royal Military Tournament at Islington.—On the 28th Sir Robert Herbert presides at the annual dinner of the Colonial Club.—On the 30th the KING'S BIRTHDAY will be celebrated, and the usual ministerial banquets held.—June 4th is DERBY DAY.

FOREIGN COUNTRIES.

Austria (Prague).—An AGRICULTURAL EXHIBITION is to be held at Prague, under the auspices of the Bohemian Central Agricultural Society, from the 15th to the 19th inst. The exhibition will comprise agricultural machines and implements, foodstuffs, etc.

Germany (Wannsee).—An INTERNATIONAL MOTOR-BOAT EXHIBITION is to be opened on 1st June, at Wannsee, a watering-place on the River Havel, near Berlin. The exhibits will include the construction, care and use of boats, launches, yachts and other craft of moderate tonnage propelled by gas, gasoline, electric or steam motors. The enterprise is under the auspices of the Middle European Motor-Carriage Association, No. 1, Universitäts-Strasse, Berlin.

Mexico.—PROPOSED PERMANENT EXHIBITION.—The United States Consul at Vera Cruz reports that the project of establishing a permanent exhibition of foreign and native products in the City of Mexico, which has been under consideration for some time, is likely soon to be an established fact. A contract has been signed between the Department of Public Improvement, on the part of the Mexican Government, and Mr. Jose Landero Cos, representing a company, by which a concession is granted to the latter to establish a permanent exhibition as above mentioned. The agreement has already been approved by the Lower House of Congress, and it is hoped it will meet the approval of the Senate. According to this agreement, the buildings for the exhibition shall be finished within three years, and cost not less than \$300,000 in Mexican currency. The concession is for a term of ten years. The administration of the exhibition will promulgate its rules and regulations, approved by the Government, in Spanish, English, French, Italian, and German. An annual catalogue will also be published in the same languages, containing a descriptive list of all the articles exhibited. Any article to be received for exhibition must be accompanied by a ticket, stating the name of the manufacturer or producer, or his agent, the name of

the article, its application, price, and all other necessary data. Enough space in each building shall be reserved for Federal Government exhibits. In order to assure the success of the exhibition, the Government of the Republic asks the different States of the Federation to obtain articles and data, and such other information as will help to extend commercial relations. All material necessary for the construction of the buildings, as well as samples of foreign products, will be admitted free of duty, under a bond guaranteeing that they are for the use of the exhibition only. However, any samples so imported which have not been sold or re-exported within one year will be assessed the usual duties according to the tariff in force at the time of importation.

Peru (Lima).—The Peruvian Consul at Southampton announces an EXHIBITION to be open in Lima for 30 days from the 1st September next, of ARTICLES AND APPARATUS connected with the USE OF ALCOHOL in the PRODUCTION OF MOTIVE POWER, HEAT AND LIGHT. The Consul states that he is prepared to receive catalogues and other information from the manufacturers of such apparatus who may be desirous of exhibiting their goods at the Lima exhibition. Further particulars will be communicated to all intending exhibitors.

NAVAL AND MILITARY INTELLIGENCE.

NAVAL.

Captain John R. Jellicoe, C.B., R.N., has been appointed Naval Assistant to the Controller of the Navy.

It is understood that Captain J. A. Tuke will be appointed Master of the Fleet at the forthcoming Naval Review.

The *Encounter*, second-class cruiser, will be launched at Devonport on June 18. She was laid down on January 28, 1901.

The cruiser *Ariadne* has been ordered to commission on June 5 for service as flagship on the North America and West Indies Station.

The battleship *Repulse* completed her refit and equipment at Sheerness on the 5th ult., and left for the Mediterranean for temporary service there before rejoining the Channel Squadron.

The *Aboukir*, armoured cruiser, was commissioned at Portsmouth by Captain C. J. Graves-Sawle for service on the Mediterranean Station.

The Admiralty have placed orders for two new battleships, one with the Fairfield Company and the other with Messrs. Vickers, Sons and Maxim.

The *Fawn*, torpedo-boat-destroyer, has been commissioned at Portsmouth for service with the Mediterranean Squadron by Lieut.-Commander R. W. Myburgh.

The *Doris*, cruiser, will, about May 6, be commissioned at Devonport by the crew of the *Arrogant*, cruiser, Captain H. C. B. Hulbert, for service with the Channel Squadron.

The *Icarus*, sloop, Commander G. F. S. Knowling, which has been relieved on the Pacific Station by the *Sharwater*, sloop, Commander C. H. Umfreville, is expected at Plymouth on May 11. She will pay off at Chatham.

The *Syren*, torpedo-boat-destroyer, was commissioned at Portsmouth by Lieut. and Commander the Hon. H. Maude and the crew of the *Teaser*, the *Syren* taking the place of the *Teaser* in the instructional flotilla.

Captain Robert S. Lowry, who was Rear-Admiral Lord Charles Beresford's Flag Captain during the whole of the time his lordship was second in command of the Mediterranean, takes over the command of H.M.S. *Howd* on the 1st inst.

The new battleship *Vengeance* was commissioned at Portsmouth on the 8th ult., for service in the Mediterranean, where she will be a valuable addition to our fleet. The *Vengeance* is the last to be completed of the *Canopus* class.

The new battleship *London*, which is named for the Prince of Wales to fly his Royal Highness's flag at the Coronation Review, will shortly after that ceremony be sent to the Mediterranean as Rear-Admiral Burges Watson's flagship, and relieve the *Royal Sovereign*.

Captain Christopher G. F. Maurice Cradock, who has just been appointed Flag Captain to Rear-Admiral Sir Baldwin Wake Walker, Bart., of the Reserve Squadron, was promoted to the rank of Commander while serving in the Royal yacht *Victoria and Albert* in August, 1896.

The *Camperdown*, battleship, Captain H. A. W. Onslow, which arrived at Spithead from Lough Swilly on the 4th ult., was taken into Portsmouth Harbour to carry out her annual repairs, which are expected to detain her at Portsmouth for some months.

The *Devastation*, battleship, Captain F. G. Kirby, which has been relieved on the Mediterranean Station by the *Irresistible*, battleship, Captain G. M. Henderson, as guardship at Gibraltar, arrived at Plymouth and was paid off at Devonport.

The *Seagull*, torpedo-gunboat, which was the first ship in the service to be fitted with the Niclausse water-tube boiler, has been completely overhauled, and is now placed at the disposal of the Boiler Committee, who will next week attend some experimental runs in her.

The new Bermuda floating dock, built by Messrs. Swan and Hunter, Limited, of Wallsend, is ordered to leave the Tyne on May 15 for Sheerness, where the *Sans Pareil*, battleship, Captain A. J. Pocklington, port guardship, will be docked to test the working of the structure before it is towed across the Atlantic to Bermuda.

The *Gossamer*, torpedo-gunboat, has arrived at Sheerness from the works of Palmer's Shipbuilding Company, Jarrow-on-Tyne, where she has been fitted with new engines and water-tube boilers. Her new machinery is to indicate 6,000 horse-power, being 2,500 horse-power in excess of the power of her former engines and her speed is expected to be increased from 19 knots to 21 knots.

According to present arrangements, Admiral Sir John Fisher will transfer the command of the Mediterranean Squadron to Admiral Sir C. E. Donville on June 4, and it is, therefore, not improbable that Sir J. Fisher will bring home his flagship, the *Renown*, in time to fly his flag at the naval review. As the *Ariadne*, cruiser, is to be commissioned at Portsmouth early in June as flagship of Vice-Admiral A. L. Douglas on the North American and West Indies Station, it is probable that that flagship will also appear in the lines at Spithead.

The first of the submarines, launched at Barrow some months ago, was further severely tested on the 4th ult. Seven persons, including Admiralty and other officials, were sealed up in the vessel, and she was several times run the length of Buccleuch docks. During each trip she was rapidly and suddenly submerged a great many times, the vessel meanwhile being kept in a straight course. The submerging, which was merely a foot or so below the surface, took only some six or seven seconds, very little more time being required to bring her to the surface again.

France.—The new French Squadron which is to be maintained in the Far East, in accordance with the recent Ministerial decision, will be made up as follows:—First Division.—The armoured cruiser, *Montcalm*, Vice-Admiral Marechal's flagship; the fast cruisers, *Guichen*, *Châteaurenault*, and *De la Gravière*; and the protected cruisers, *Friand* and *Bugeaud*. Second Division.—The fast cruiser, *D'Entrecasteaux*, flagship of Rear-

Admiral Bayle; and the protected cruisers, *Pascal*, *Sfax*, *Catinat*, *Infernet*, and *D'Estrées*.

The *France Militaire* states that the submersible *Silure* has been making some interesting experiments outside the harbour at Cherbourg. Among other things it sank to a depth of 134 ft., at which it was found that the hull was compressed to the extent of 1-25th of an inch (1mm.). No inconvenience was felt by the crew greater than that experienced at a depth of from 20 ft. to 25 ft.

Germany.—*Ueberall* publishes full details of the German cruiser *Frauenlob*, which was launched at the Weser Yards, Bremen, on March 22. She has been known hitherto as small cruiser "G." Her length between perpendiculars is 328 ft.; beam, 39 ft. 4 in.; displacement when drawing 16½ ft. of water, 2,700 tons; engines, 8,000 horse-power; speed, 22 knots; bunker capacity, 600 tons; radius of action at moderate speed, 6,000 miles. Her two propellers are three bladed and made of bronze. Her boilers are of the Thornycroft-Schultz type. Her armour deck runs the whole length of the vessel, and the coal is stowed so as to serve as a further protection. She carries 12 145 in. guns, 12 machine-guns, and two submerged torpedo tubes. Two powerful dynamos supply the electricity for two search-lights, for the general lighting, and for the motive power of the hoists, ventilators, pumps, capstans, steering gear, etc.

A new German cruiser, to be known at present as the *Ersatz Kaiser*, has been laid down recently at the Imperial Yards, Kiel, where the *Fürst Bismarck* and *Prinz Heinrich* were built; and where the *Prinz Adalbert* is being finished. A fifth cruiser, the *Ersatz König Wilhelm*, is building by Blom and Voss, at Hamburg. The five cruisers are of much the same type, but the newest vessel will have engines of greater horse-power and a speed which is also greater, of from 22 to 23 knots. She is not to be finished until 1905.

The Germania Yards, Kiel, have in hand a number of torpedo-boats for the German navy. The length is nearly 126 ft.; beam, 22 ft.; and displacement, 350 tons. One recently launched made a *maximum* speed at her trials of 28½ knots in Eckernförde Bay, where the water is shallow. In deeper water she is expected to add another knot to her speed. The boat bears the number G 108.

United States.—The Naval Committee of the House of Representatives have decided to recommend the building of two battleships of 16,000 tons each, two armoured cruisers of 14,500 tons, and two gunboats of 1,000 tons. The battleships will be the largest ever authorized for the American navy.

MILITARY.

Captain C. G. Pritchard, Royal Garrison Artillery, has been appointed Commandant of the Hong Kong Volunteers.

Major-General Sir Leslie Rundle is to take over the command of the South-Eastern District this month.

Major Cecil Daniel, 1st Royal Scots, has been appointed Governor of the new Military Prison at Woking.

Lieut.-Colonel the Hon. H. Lawrence, 17th Lancers, has vacated his appointment on the Intelligence Staff, in order to take over the command of 17th Lancers in South Africa.

Colonel Belfield, Royal Munster Fusiliers, formerly Assistant-Adjutant-General at Aldershot, has been appointed Acting Inspector-General of the Imperial Yeomanry in South Africa.

Lieut.-Colonel J. Stock, 2nd Battalion Essex Regiment, has been selected to succeed Colonel W. Wood in command of the 44th Regimental District at Warley.

Major E. M. Percival, D.S.O., Royal Artillery, has been appointed to command the 1st Battalion Imperial Yeomanry in South Africa, with the temporary rank of Lieut.-Colonel.

Major W. V. Dickinson, second in command of the 2nd Battalion Welsh Regiment, has been selected to succeed Lieut.-Colonel Penno in command of the regiment.

Major T. McCulloch, Royal Army Medical Corps, has been appointed Deputy Assistant Director Army Medical Service at headquarters, in succession to Major W. G. Macpherson.

Colonel E. A. W. S. Grove, C.B., has been selected to succeed Colonel F. B. J. Jerrard as chief on the staff of the General commanding the Scottish District, Edinburgh.

Captain Younghusband, 19th Bengal Lancers, has been appointed second in command of the 26th Battalion Imperial Yeomanry for service in South Africa.

Major H. H. L. Malcolm, D.S.O., second in command of the 1st Battalion Cameron Highlanders, has been selected to succeed Colonel J. M. Hunt in command of the 2nd Battalion.

Major-General Lord Dundonald has been appointed to command the Canadian Militia in succession to Major-General O'Grady Haly.

Captain Matthews, Royal Monmouthshire Engineer Militia, who has been serving in South Africa, has left for India, to take up the appointment of aide-de-camp to Lord Amthill, Governor of Madras.

The King has been pleased to approve that the Army Temperance Association and the Army Temperance Association of India shall in future be conjointly styled the "Royal Army Temperance Association."

Major A. E. Simpson, at present second in command of the 3rd Battalion Manchester Regiment, stationed at North Camp, Aldershot, has been selected to succeed Lieut.-Colonel A. E. R. Curran in command of the 1st Battalion.

Major-General Parr, C.B., is to succeed Major-General Swaine in the command of the North-Western District at Chester. Major-General Parr has been in charge of the South-Eastern District during the absence of Sir Leslie Rundle in South Africa.

Colonel S. H. Harrison, King's (Liverpool) Regiment, Commandant of the Petersburg District and Lines of Communication north of Nylstroom, has been appointed to command the Royal Munster Fusiliers (101st) Regimental District at Tralee, succeeding Colonel D. G. Johnston.

Lieut.-Colonel T. Lyons Biggar, Assistant Quartermaster-General for Canada, has joined at Aldershot, by order of the Canadian Government, to study the organisation of the Army Service Corps, a branch of the service now being added to their establishment.

Colonel Waters, C.V.O., has been confirmed in his appointment as Military Attaché to the Embassy at Berlin, and he will hold it until June, 1905. Colonel Waters was temporarily appointed in the place of Colonel Grierson, M.V.O., who had been ordered to South Africa.

The King's Colonials, Imperial Yeomanry, the new County of London Regiment, raised by Lieut.-Colonel Willoughby Wallace, were inspected by Major-General Sir H. Trotter on the Horse Guards' Parade on Sunday the 27th ult. After the inspection the regiment marched to St. George's Church, Hanover-square, and attended a special service at 3.30 p.m.

The King has approved of Major-General W. F. Vetch, now Assistant Director-General of Ordnance on the Headquarters Staff, being appointed a Major-General on the Staff to command the 13th Brigade at Dublin. Major-General Sir G. de C. Morton, now commanding the Dublin District, will in future command the 7th Division.

Colonel R. Auld, now Assistant Quartermaster-General on the Headquarters Staff, is to be appointed Deputy Quartermaster-General, a new appointment, and will be succeeded as Assistant Quartermaster-General by Lieut.-Colonel F. T. Clayton, C.B., Army Service Corps, now at Aldershot, after previous Staff service in South Africa.

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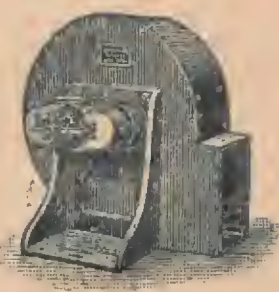
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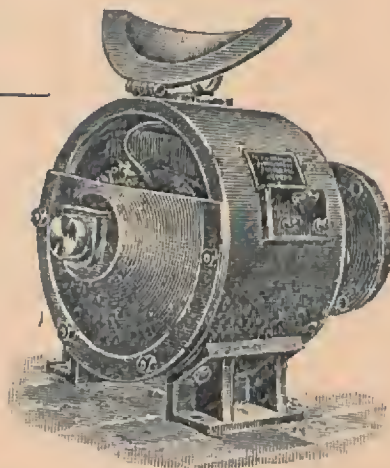
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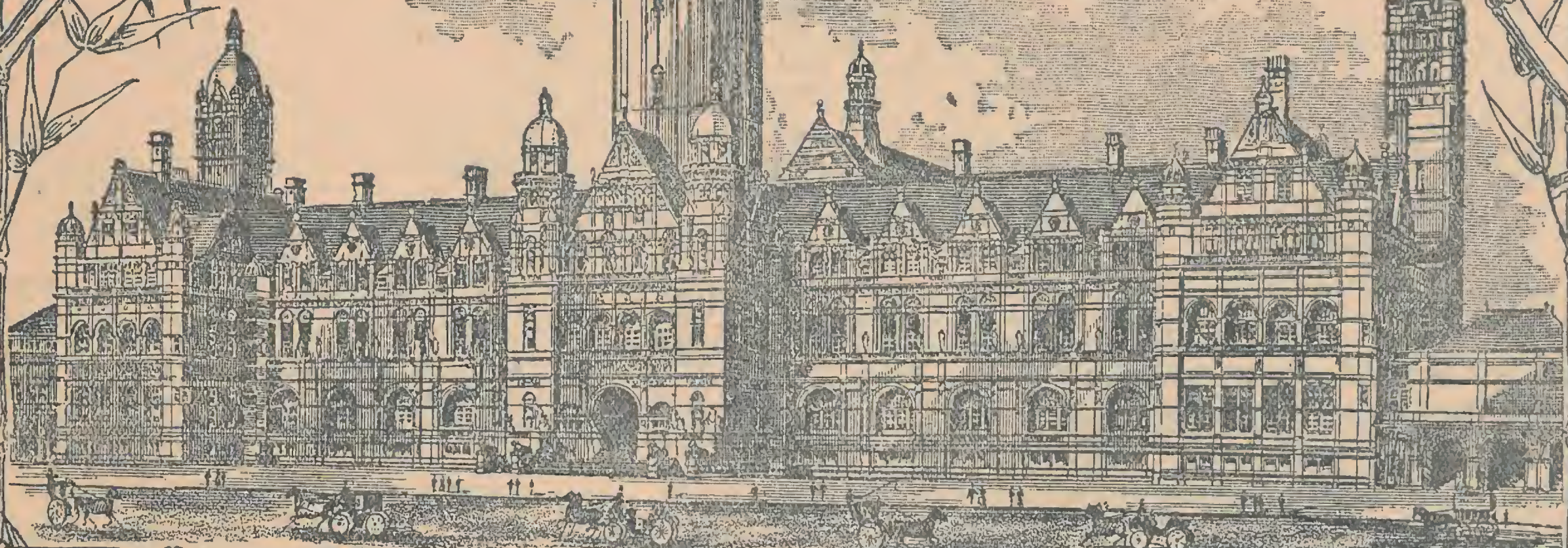
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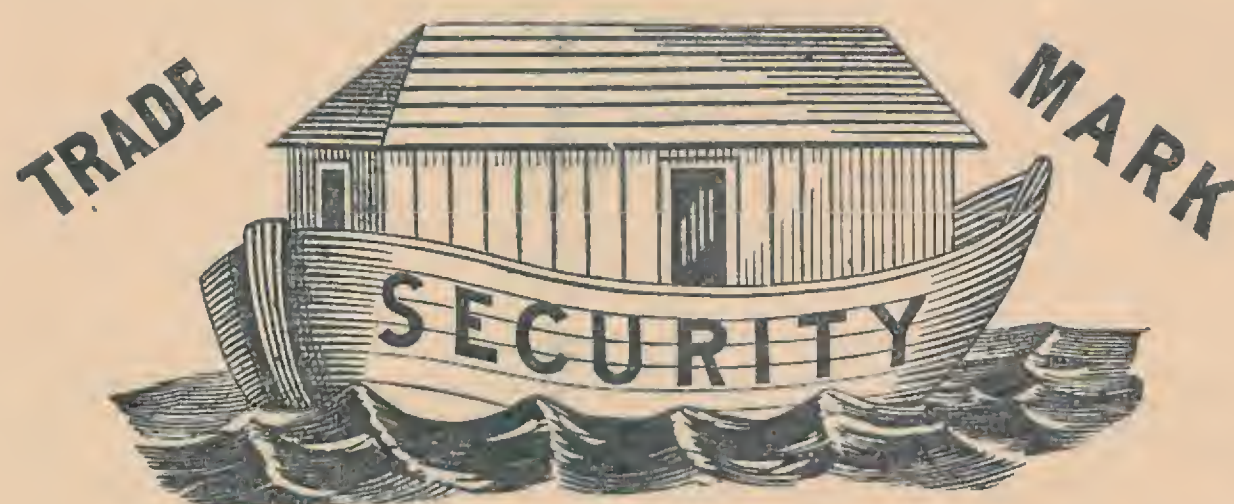
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FALKLAND ISLANDS. (Middle of Central Lower Gallery.)

Representative Governor.—Gen. SIR ROBERT BIDDULPH, G.C.B., G.C.M.G.

Corresponding Agent.—THE COLONIAL SECRETARY.

Products Exhibited.—Wool, birds' skins and eggs.

BRITISH AUSTRALASIA.

NEW SOUTH WALES.

(East Central Upper and Lower Galleries.)

Representative Governor.—The Hon. HENRY COPELAND (Agent-General), and

SIR DANIEL COOPER, Bart., G.C.M.G.

Corresponding Agent in Colony.—(At present through Agent-General's Office.)

Products Exhibited.—Minerals (including gold, silver, coal, &c.), wool, indigenous timbers, wines, cereals, seeds, gums, resins, oils, fibres, rope, leather, tallow, etc., etc.

VICTORIA.

(East Central Upper and Lower Galleries.)

Representative Governors.—HOWARD SPENSLEY, Esq., and [VACANT].

Corresponding Agents in Colony.—(At present through Agent-General's Office.)

Officer in Charge of Collection.—Mr. A. G. BERRY (of the Agent-General's Office.)

Products Exhibited.—Animals, birds, coal, cereals, chemical manufactures, cigars, essential oils, gums, grain, hops, indigenous timbers, leather, leatherware, minerals (including auriferous quartz, coal, kaolin, etc.), models of gold nuggets, seeds, sugar, tobacco, wines, wool, etc., etc.

SOUTH AUSTRALIA.

(East Central Lower Gallery.)

Representative Governors.—H. A. GRAINGER, Esq. (Agent-General), and HENRY

BULL TEMPLAR STRANGWAYS, Esq.

Corresponding Agent in Colony.—(At present through Agent-General's Office.)

Officer in charge of Collection.—Mr. EDMUND SNELL (of the Agent-General's Office.)

Products Exhibited.—Agricultural produce, wines, indigenous timbers, furniture, wool, etc.

QUEENSLAND (AND BRITISH NEW GUINEA).

(East Central Lower Gallery.)

Representative Governors.—The Hon. SIR HORACE TOZER, K.C.M.G. (Agent-General),

and Gen. SIR HENRY W. NORMAN, G.C.B., G.C.M.G., C.I.E.

Corresponding Agent in Colony.—(At present through Agent-General's Office.)

Curator of Collection.—(In charge of Institute Staff.)

Products Exhibited.—Building stones, eucalyptus oils, fibres, minerals, pearl shells, indigenous woods, cereals, models of fruits, sugar, wine, tinned meats, hides, skins, leather, etc., etc.

WESTERN AUSTRALIA.

(East Central Lower Gallery.)

Representative Governor.—The Hon. H. B. LEFROY (Agent-General).

Corresponding Agent in Colony.—(At present through Agent-General's Office.)

Curator of Collection.—(In charge of Institute Staff.)

Products Exhibited.—Wools, gums and resins, olive oil, fibrous barks, silk, skins, indigenous woods, minerals, model gold ingots, etc., etc.

TASMANIA.

(East Central Lower Gallery.)

Representative Governor.—The Hon. ALFRED DOBSON (Agent-General).

Corresponding Agent in Colony.—Mr. T. C. JUST, Chief Secretary's Office, Hobart.

Curator of Collection.—(In charge of Institute Staff.)

Products Exhibited.—Cereals, minerals, models of fruits, stuffed fish, furs, timbers, illustrations of local manufactures, etc., etc.

NEW ZEALAND.

(East Central Lower Gallery.)

Representative Governors.—The Hon. W. P. REEVES (Agent-General), and THOMAS

MACKENZIE, Esq. *Corresponding Agent in Colony.*—(At present through Agent-

General's Office.) *Curator of Collection.*—(In temporary charge of Institute Staff.)

Products Exhibited.—Agricultural produce, building stones, coal, Kauri gum, hemp and flax, tinned meats, wools, tobacco, Kauri and other woods, with illustrations of their application to structural and ornamental purposes; photographs, etc., etc.

FIJI.

(Middle of Central Lower Gallery.)

Representative Governor.—Gen. SIR ROBERT BIDDULPH, G.C.B., G.C.M.G.

Corresponding Agent in Colony.—Hon. JOHN HILL, Suva.

Curator of Collection.—(In charge of Institute Staff.)

Products Exhibited.—Barks, fibres, copra, tea, cocoa, coffee, timbers, etc.

BRITISH INDIA (AND ASIA).

INDIA.

(East Gallery and Pavilion.)

Representative Governors.—Vide p. 144.

Special Sub-Committee, in charge of the Indian Section (appointed by the Secretary of State for India in Council):—*Chairman*: Major-General SIR OWEN TUDOR BURNE, G.C.I.E., K.C.S.I.

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J. LYALL, K.C.S.I., C.I.E.; Major-General JAMES WATERHOUSE.

Secretary: Mr. J. R. ROYLE, C.I.E.

Channel of Correspondence.—THE REVENUE AND AGRICULTURAL DEPARTMENT, INDIA.

Curator of Collection.—Mr. J. R. ROYLE, C.I.E.

Products Exhibited.—Fodder grasses, foods and food stuffs, sugar, spices and condiments, models of fruits, narcotics (including opium, ganja, etc.), tobacco and cigars, tea and coffee, oils and oil-seeds (including those of castor, sesamum, linseed, cocoa-nut and ground nut, etc.), a large assortment of drugs, dyes and tans, gums and resins (including the resins and turpentine of Indian pines, wax, lac, etc.), an extensive collection of fibres (including cotton, silk, jute, coir, reha, agave, etc.), models illustrating the manufacture of cotton and jute, minerals (including building stones, coal, mica, soapstone, corundum, iron ores, steel, etc.), timbers, collection of Indian pottery, carved woodwork, silver, brass and copper ware, silk and cotton fabrics.

CEYLON.

(East Gallery.)

Representative Governor.—The Rt. Hon. the LORD STANMORE, G.C.M.G.

Executive Officer and Home Agent.—FREDK. H. M. CORBET, Esq., Barrister-at-Law.

Curator of Collection.—Mr. J. R. ROYLE, C.I.E.

Products Exhibited.—Cereals, pulses, edible fruits, roots and grains, spices and condiments, drugs, horns, skins, pearls, shells, wax, oils, gums, resins, dyes, tans, fibres, timbers, building stones, plumbago, metallic ores, rough gems, palm products, tea, coffee, cocoa, cinchona bark, sugar, tobacco, cotton-cloth, mats, rattan and basket work, wood and ivory carving, metal-work, pottery, tortoise-shell and porcupine quill work, lacquer work, lace, etc., etc.

STRAITS SETTLEMENTS (AND JOHOR).

(East Gallery.)

Representative Governor.—SIR CECIL CLEMENTI SMITH, G.C.M.G.

Corresponding Agents.—The COLONIAL SECRETARY (at Singapore); The Dato JAMES

MELDRUM (for Johor). *Curator of Collections.*—(In charge of Institute Staff.)

Products Exhibited.—Barks, canes, drugs, fibres, preserved fruits (including Singapore pine-apples), mats, silk fabrics, oils and oil-seeds, dyes and tans, gums, gutta-percha, tin ores and other minerals, teas, coffee, spices, timbers, etc., etc.

MAURITIUS (AND SEYCHELLES).

(West Central Lower Gallery.)

Representative Governor.—[VACANT.]

Corresponding Agent in Colony.—Mr. A. DARUTY DE GRANDPRÉ, Museum Superintendent.

Corresponding Agent for Seychelles.—The Hon. E. B. SWEET-ESCOTT, C.M.G., Administrator.

Curator of Collection.—(In charge of Institute Staff.)

Products Exhibited.—Fibres, hemp, oils, rum, seeds, sugars, tortoise-shell, vanilla beans, with specimens of native workmanship, etc., etc.

HONG KONG.

(Middle of Central Lower Gallery.)

Representative Governor.—SIR WILLIAM ROBINSON, G.C.M.G.

Corresponding Agent in Colony.—THE HARBOUR MASTER.

Curator of Collection.—(In charge of Institute Staff.)

Products Exhibited.—China, carved and inlaid ivory and wood-work, silver and lacquer ware, silk and cotton fabrics, drugs, paints, dyes, food stuffs, etc., etc.

BRITISH NORTH BORNEO.

(West Central Lower Gallery.)

Corresponding Agent.—(At present through the British North Borneo Co.)

Curator of Collections.—(In charge of Institute Staff.)

Products Exhibited.—Timbers, rattans, coal, rice, sago, sugarcane and raw sugar, coffee, cocoa pods, pepper, tobacco, beeswax, camphor, gutta-percha, kapok fibre, dammars, cutch and gambier, hemp, honey, etc.

BRITISH POSSESSIONS (EUROPE).

MALTA, GIBRALTAR, AND CYPRUS.

(West Central Gallery.)

Representative Governor.—Gen. SIR ROBERT BIDDULPH, G.C.B., G.C.M.G.

Corresponding Agent.—(At present through the Representative Governor.)

Curator of Collections.—(In charge of Institute Staff.)

Products Exhibited.—From Malta—Carved stone-work, lace, macaroni, honey various fabrics, models, pictures, etc., etc. Gibraltar and Cyprus—None at present.

IMPERIAL INSTITUTE JOURNAL.

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JUNE, 1902.

GENERAL NOTICES.

"THE IMPERIAL INSTITUTE JOURNAL."

Fellows resident in the United Kingdom, the Colonies, India, and Foreign Countries, are supplied with the JOURNAL free by post each month.

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The JOURNAL may also be purchased for **Sixpence** each copy at the Ticket Office of the Institute and at the railway book-stalls of Messrs. WILLING & Co.

The City Agents for the JOURNAL are Messrs. WILLING & Co., 17, Royal Exchange, London, E.C. It may also be obtained at the offices of the printers, WATERLOW & SONS LIMITED, Blomfield-house, London-wall, London, E.C.

Communications respecting Advertisements should be addressed to the ADVERTISEMENT MANAGER, 6, Arundel-street, Strand, London, W.C.

This JOURNAL is distributed (by post) throughout the United Kingdom, India, and the Colonies of the British Empire, and to the following Foreign Countries:—Argentine Republic, Austria-Hungary, Belgium, Bolivia, Chili, China, Colombia, Costa Rica, Denmark, Egypt, France, Germany, Greece, Hawaiian Islands, Holland, Italy, Japan, Mexico, Montenegro, Morocco, Norway, Persia, Peru, Portugal, Russia, Siam, Spain, Sweden, Switzerland, Tripoli, Turkey, United States of America, Uruguay, and Venezuela. The JOURNAL is also placed in the Reading Rooms of CHAMBERS OF COMMERCE, CLUBS, and HOTELS, both at home and abroad.

SPECIAL NOTICE.

EXHIBITION OF GIFTS AND ADDRESSES PRESENTED TO THE PRINCE AND PRINCESS OF WALES, DURING THEIR COLONIAL TOUR IN 1901.

His Royal Highness the PRESIDENT of the IMPERIAL INSTITUTE has decided that an EXHIBITION shall be held in the North Gallery of the Institute of the GIFTS and ADDRESSES presented to their Royal Highnesses the PRINCE AND PRINCESS OF WALES on the occasion of their visiting the Colonies in 1901. The Exhibition is open to the Public (Admission 1s.) on week-days, from 11 a.m. to 7 p.m. until further notice. The PRINCE OF WALES has also decided that the proceeds of the Exhibition shall be added to the "CORONATION GIFT" to KING EDWARD'S HOSPITAL FUND.

SPECIAL EXHIBITION OF COLONIAL PRODUCTS AND INDUSTRIES.

A Special Exhibition of Collections illustrative of the Mineral Wealth and of certain Industries of the DOMINION OF CANADA, also of commercial products from QUEENSLAND, RHODESIA, WESTERN AUSTRALIA, and BRITISH NORTH BORNEO, is on view in the western half of the North Gallery, from 11 a.m. to 7 p.m., on week-days—**Admission Free.**

The whole of the Collections at the Institute will be open until 7 p.m. during the continuance of the Exhibition of Gifts and Addresses.

FELLOWS' DEPARTMENT.

The Reading, Writing, and News Rooms, are open for the use of Fellows every week-day from 10 a.m. till 11.30 p.m., and on Sundays from 3 p.m. to 10.30 p.m. The Library (on the First Floor), is open from 10 a.m. to dusk on Week-days, and from 3 p.m. to dusk on Sundays. The Map Room (First Floor) is open from 10 a.m. to 5 p.m. on Week-days.

The Poste Restante is open every week-day for receipt and delivery of letters and parcels. Letters addressed to initials only are not received, except in reply to notices in the JOURNAL, under "Requirements" Registry. The General Post Office Pillar Box is cleared daily twelve times, between 10.10 a.m. and midnight. Light refreshments only are, for the present, provided in the Fellows' Rooms and at the bar of the Ceylon Kiosk.

EMIGRATION INFORMATION OFFICE.

The Office of the British Women's Emigration Association (*see page 162*), in the West Corridor, First Floor, is open daily from 10 a.m. to 4 p.m., and advice and information respecting emigration and openings in the Colonies may be obtained there free of charge. Enquiries of all kinds relating to the Colonies from intending Emigrants are dealt with in the Commercial Intelligence Department, and special information respecting Canada and the Cape Colony may also be obtained from the Curators for these Colonies, on application personally at their offices, or by letter.

SCHOOL OF MODERN ORIENTAL STUDIES.

An "Ouseley" Scholarship of £50 per annum, tenable for two years, will be awarded, should sufficient merit be shown, for proficiency in PERSIAN. No person will be admitted to competition for a Scholarship in a language which is his own mother tongue, nor for a Scholarship in a language allied to his mother tongue. The examination will take place early in July next. Full particulars may be obtained of the Secretary to the School, Imperial Institute. (*For further information see page 160.*)

SCIENTIFIC AND TECHNICAL DEPARTMENT.

The Scientific and Technical Department of the Institute has been established to acquire information by special enquiries and by experimental research, technical trials and commercial valuation regarding new or little known natural or manufactured products of the various Colonies and Dependencies of the British Empire and of foreign countries, and also regarding known products procurable from new sources, and local products of manufacture which it is desired to export. This work is carried out with a view to the creation of new openings in trade, or the promotion of industrial developments.

In the extensive and well-equipped series of Research Laboratories occupying the West Corridor of the Second Floor, a staff of skilled Chemists, under the direction of Professor Wyndham R. Dunstan, M.A., F.R.S., carry out the investigation of the chemical constitution and properties of new dye-stuffs, tanning materials, seeds and food-stuffs, oils, gums and resins, fibres, timbers, medicinal plants and products; animal products, minerals and ores, soils, cements, and various other products, with a view to their commercial utilization. Whenever necessary these materials are submitted to special scientific experts, by whom they are made the subjects of particular investigation or practical tests. Reports are also obtained from technical or trade-experts in regard to the probable commercial or industrial value of any such products, whilst full information is collected from official or other trustworthy sources regarding the probable extent and cost of available supplies. All materials requiring scientific or technical examination, or commercial valuation, should be submitted to the Institute for examination either by, or through, the Foreign Office, the Colonial Office, the India Office, or the Board of Trade, or through the Colonial or Indian Government Authorities. Requests for the examination of such materials may also be submitted by Public Commercial Bodies and Institutions of the respective Colonies and Dependencies, or by the Representatives of H.M. Government in foreign countries.

COMMERCIAL INTELLIGENCE DEPARTMENT.

The Office of this Department, in the West Corridor, First Floor, is open daily from 10 a.m. to 5 p.m. (on Saturdays till 1 p.m.), for the purpose of answering enquiries and supplying information relating to the Commerce (Export and Import) and Industries of India and the Colonies. Applications may be made personally or by letter. Special information may be obtained from the Curators in charge of the Indian and of certain Colonial Collections. Arrangements have been made for the translation for mercantile firms of Trade Circulars, Price-Lists, and Catalogues into any Foreign Language, including the conversion of weights, measures and coinages, etc., at cost price, and application for such may be addressed to this Department.

COMMERCIAL COLLECTIONS.

The Galleries containing the Colonial and Indian Collections, and the Public Commercial and Industrial News Room, are open for free inspection by the public daily, *except Sundays, and any days specially notified*, from 11 a.m. until 7 p.m. Every information concerning the products, their supply, etc., can be obtained on application to the Curators of the Indian and Ceylon, Canadian, and South African Sections, to the general Curator, and to the Commercial Intelligence Department.

CITY BRANCH OF THE IMPERIAL INSTITUTE.

REMOVAL TO 49, EASTCHEAP, E.C.

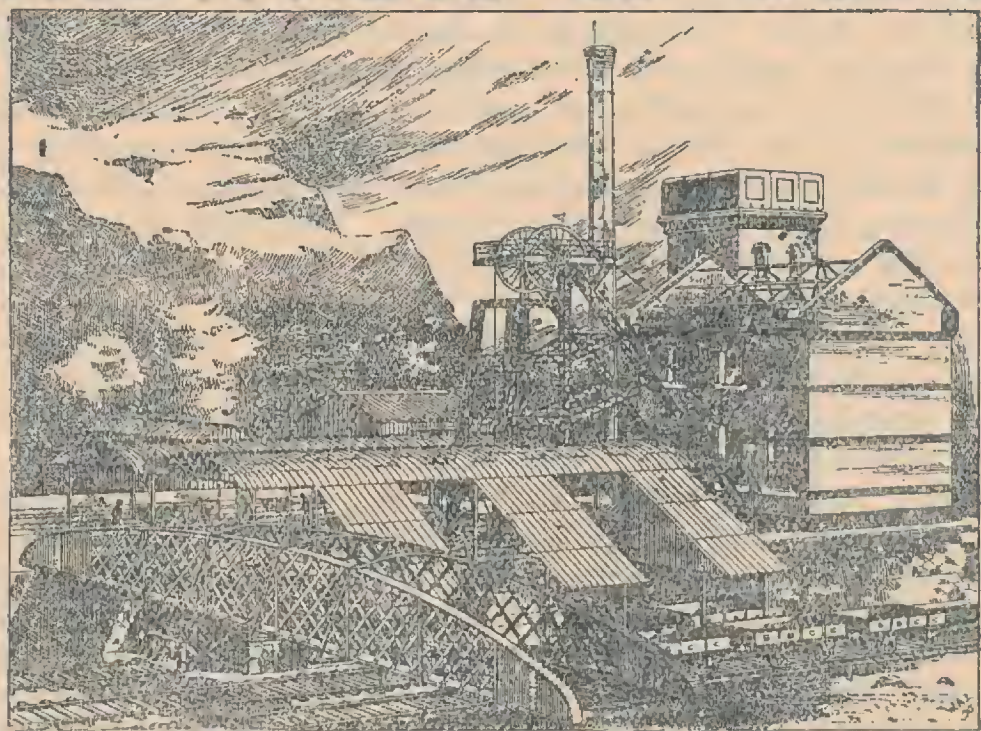
The City Enquiry Office and Reading Room have been removed from 112, Cannon-street to larger premises at 49, EASTCHEAP, where a commodious apartment is also provided for the display, to merchants, manufacturers, etc., of raw and manufactured products received, from time to time, from the Colonies and from India, and for which it is desired to find openings in British markets. Curators and other members of the Imperial Institute staff will attend at the Office, at stated times and by special appointment, to deal with enquiries and to assist in establishing or facilitating business relations with mercantile houses, etc., in the Colonies and India. The City Branch is in constant communication, by telephone and messengers, with the Imperial Institute, South Kensington. (*For further information see page 160.*)

THE NORTHBROOK SOCIETY.

The Northbrook Society is affiliated to the Imperial Institute, and has a special room allotted for the exclusive use of its members in the Institute buildings. Its primary objects are to watch over and promote the interests of natives of India, and to provide a system of guardianship or supervision over such as are sent to Europe for education. The Society is controlled by a committee consisting of an equal number of Governors of the Imperial Institute and members of the Society, presided over by the Earl of Northbrook. It possesses an excellent library. Indian members, who pay no subscription to the Society, have the especial advantage of becoming Fellows of the Institute at half the usual subscription payable by the ordinary Fellows. Applications for membership of the Society should be addressed to the Secretary of the Northbrook Society, Imperial Institute, London, S.W.

ROYAL BRITISH NURSES' ASSOCIATION.

The Annual General Meeting of this Association will be held in the Imperial Institute on Monday, 16th June, at 12 o'clock noon. Her Royal Highness PRINCESS CHRISTIAN, President of the Association, will preside.

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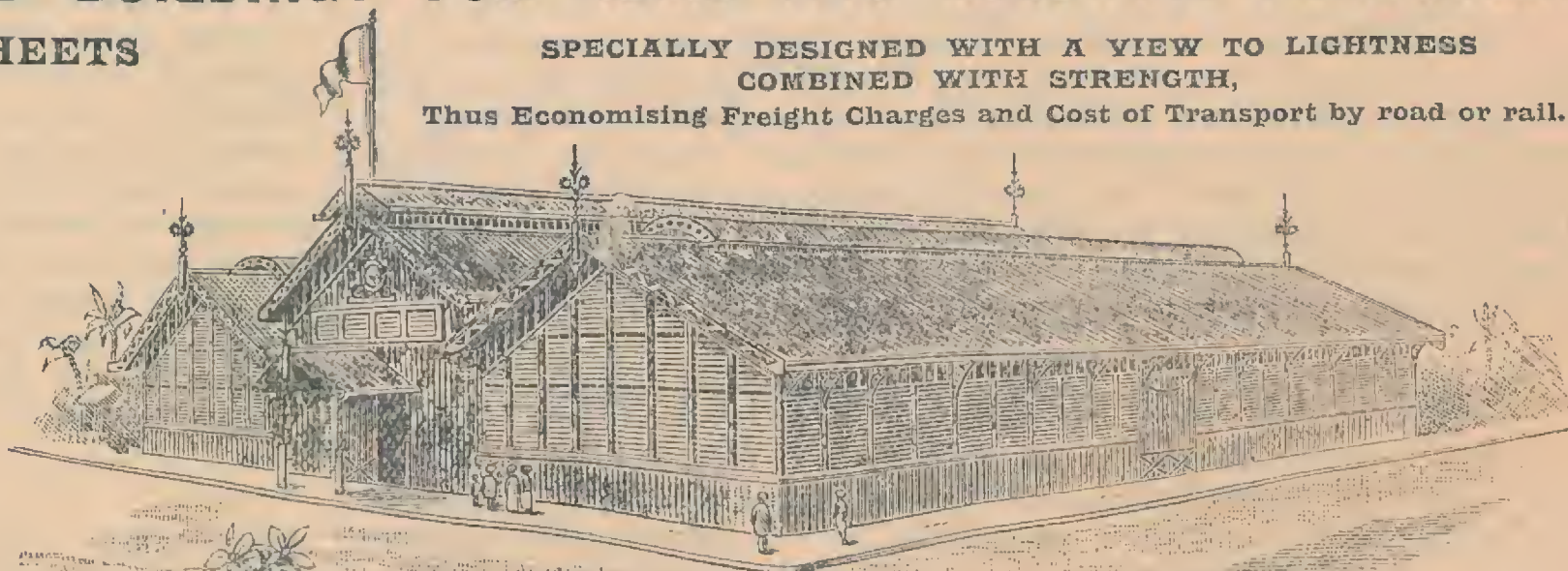
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FINANCIAL AND COMMERCIAL RETROSPECT.

UNITED KINGDOM.—According to the Board of Trade returns of the foreign trade for April, the imports, valued at £46,199,928, were £65,689, or 0·1 per cent. less than in the same month of last year. In April, 1901, there were only 24 working days against 26 in last April, but, on the other hand, the figures for last year were abnormally large, owing to the heavy importations of sugar in anticipation of the Budget proposals. In April last there were increases in manufactured articles, miscellaneous articles, metals, raw materials for sundry industries, chemicals, oil and tobacco; but in other classes there were decreases, among them being one of over two millions sterling in the category of food and drink liable to duty, in which of course sugar is included. In meat of all sorts, whether dead or in the form of living animals, there was a general decrease, both as to quantity and value, though it was not quite so pronounced in the latter as in the former. There were smaller shipments both of cattle and sheep and of beef, from the United States. In cereals, wheat, valued at £2,238,441, showed a rise of 5·5 per cent. in quantity, though only 1·4 per cent. in value. Wheat-flour, however, was one-third less in amount, and its value fell from £1,000,643 to £633,151. In oats and Indian corn there was a decrease in quantity of just over 14 per cent. in both cases, but whereas the value of the former increased by 7·6 per cent., that of the latter fell off by 6·6 per cent. Barley improved 5·4 per cent. in amount, and 7·3 per cent. in value. In raw materials for textile manufactures, smaller consignments of raw cotton from the United States reduced the quantity by 21·5 per cent., while the value fell by 23·8 per cent. (£917,268). Cotton manufactures increased in value by 32·8 per cent. Sheep and lambs' wool, however, owing to larger arrivals from Australasia, was 19·2 per cent. higher in quantity, and increased in value by £460,565 (15·4 per cent.) to £3,447,544. Jute, silks, alpaca wool and goats' wool, were more in quantity and value, but flax and hemp were less. In metals, iron ore, pig iron, bar iron and unwrought steel, were all higher in value and quantity, and though copper ore and regulus were lower in both respects, unwrought copper showed a large improvement. Lead and crude zinc were also much higher, and tin gained about the same fractional percentage in value that it lost in quantity. Wood, sawn and hewn, was worth £1,073,040, the value having decreased by 2·8 per cent., although the quantity increased 5·6 per cent. The exports of British and Irish produce were valued at £23,492,529, an increase of £1,505,496, or 6·8 per cent., being thus shown; the increase is spread over every class of articles except raw materials, metals, and new ships. Coal, although 0·2 per cent. greater in amount, decreased in value by 9·5 per cent. to £2,200,133. Iron and steel were 14·8 per cent. greater in quantity, and 16·4 per cent. in value. Machinery rose in value by 7·1 per cent. to £1,655,067. Cotton yarn was 1·2 per cent. less in value, though 11·0 per cent. greater in quantity, but cotton piece-goods rose 16·2 per cent. in the latter respect, and 10·7 per cent. in the former, to a total value of £4,882,896, the larger shipments being mainly to China. Other cotton manufactures increased by £75,457. Woollen and worsted yarn increased 14 per cent. in quantity and 6·6 per cent. in value, while in both woollen and worsted tissues there were substantial improvements, the increase in quantity being 10·0 per cent. and 13·9 per cent. respectively, and in value 9·2 per cent. and 5·3 per cent. In chemicals, soda compounds rose in value by 27·8 per cent. to £116,611, but the improvement in quantity was still larger, viz. :—34·5 per cent.; chemical manures fractionally declined in amount, but their value was 25·2 per cent. greater. The re-exports of colonial and foreign merchandise were valued at £6,673,949, an increase of £387,942 as compared with April, 1901.

Lloyd's shipbuilding returns for the first quarter of this year state that on March 31st there were, excluding warships, 431 vessels, of 1,120,344 tons gross, under construction in the United Kingdom. At the same period of last year, the number of vessels was 444, and the gross tonnage 1,303,116. Of the tonnage in hand, 1,000,774 tons are for home account, 30,574 tons are for Germany, 22,300 tons for Austria-Hungary, 20,839 tons for Holland, and 14,020 for France. The total is about 119,000 tons less than that shown by the returns for the previous quarter.

Details were published during the month of the Atlantic Shipping "Combine," which has recently been attracting so much attention. The corporation, organized under the auspices of Messrs. J. P. Morgan & Co., is to be registered according to the laws of the State of New York or other State they may select, and is to have a total capital of \$120,000,000; one-half of this is to be 6 per cent. preferred stock with limited cumulative dividends, and the other half common stock, limited to 10 per cent. dividends so long as there are outstanding any of the £50,000,000 of 4½ per cent. collateral trust debentures which are also to be created, and of which the principal is to be payable in 20 years, the corporation possessing the right to redeem them at any time after five years at 105. The properties to be acquired by the Corporation are 750 fully paid shares of £1,000 each in the White Star Company, including all the ships now being built for it, and the goodwill, assets, etc., of Messrs. Imrie, Ismay & Co., including the position of managers of the White Star Line so far as the White Star Line vendors can dispose of it; all the shares of the Dominion Line, the American Line, and the Atlantic Transport Line, including new ships in course of construction for those lines; and 118,463 ordinary and 58,703 preference shares of the Leyland Line. The valuation of the several properties is, in every case, on the basis of ten times the net profits of the different companies in 1900, subject, however, to certain deductions and

exceptions. There is also a builder's agreement between Messrs. Harland & Wolff, of Belfast, and Messrs. J. P. Morgan, by which the former are bound not to build for shipowners who are not parties to the "Combine," except the Hamburg-American line. In return they are to have all the shipbuilding required by the corporation in this country, although the corporation is at liberty to place orders for ships in the United States if it thinks fit. The arrangement has given rise to a great deal of discussion—much of it necessarily futile in the absence of any detailed knowledge of the plans and policy of the promoters—and while some people regard it as a serious blow to the interests of British shipping on the North Atlantic, others hold that too much stress may be laid on sentimental objections and that, even from the British point of view, the combination presents undeniable advantages. It may be pointed out that the total tonnage passing under the control of the "Combine" seems to be of the order of three-quarters of a million gross tons; this is, undoubtedly, a very large proportion of the tonnage employed on the North Atlantic, although important lines like the Allan, Anchor, and Cunard, appear to stand outside, but it is quite a small fraction of the total tonnage registered in the United Kingdom, and what those should do who object to this Americanization is to cease idle lamentations about lack of patriotism, etc., and set to work to ensure that the residue is worked to the best possible purpose, and that its powers are developed as widely and as energetically as possible.

COLONIES.—The Rand gold output in April is reported as 119,588 oz. of fine gold, worth £502,269, against 104,127 oz. in March. This amount is about one-fourth of the Rand output in the same month of 1899 before the outbreak of war. It is computed that at the present time nearly 2,000 stamps are at work out of a total of about 6,000. The Rhodesian output for April, at 17,559 oz., shows a substantial increase over that for March—16,891 oz.—in spite of reported difficulties from cattle disease. In Western Australia the yield was 159,225 oz., obtained from 142,906 tons of ore, the average yield being thus 1 oz. 2 dwt. 6 grs. per ton. In April of last year the yield was 143,809 oz., the amount extracted per ton being 1 oz. 1 dwt. 18 grs. In Queensland the yield was 67,370 oz., and in Victoria 48,946 oz. In New Zealand, the accounts for the past financial year show that the revenue, which amounted to £6,185,403, exceeded the estimates by £214,070, including the sum of £42,769 recovered on account of war expenditure, and there was a surplus of £279,489. The expenditure, which exceeded the estimates by £2,788, amounted to £5,895,914, exclusive of £19,000 expended in paying off debentures.

The following table shows the variations which have occurred in certain Colonial Government securities during the last three months :—

	26th Mar.	28th April.	28th May.
Canada 3 per cent. . . .	101 - 101½	102½ - 103½	103½ - 104
Cape 3 per cent. . . .	96½ - 97	97½ - 97½	98 - 98½
Natal 3 per cent. . . .	93½ - 94½	95 - 96	96½ - 97½
New S. Wales 3 per cent. .	95 - 95½	95½ - 96½	95 - 95½
New Zealand 3 per cent. .	93½ - 94	95½ - 96	95½ - 96
Queensland, 3 per cent. .	95 - 95½	95½ - 96½	95½ - 96½
South Australia 3 per cent. .	94 - 94½	95 - 95½	96 - 96½
Tasmania 3½ per cent. .	103½ - 104½	103½ - 104½	104½ - 105½
Victoria 3 per cent. . . .	96½ - 97	97½ - 97½	98½ - 98½
West Australia 3 per cent. (May-Nov.)	93½ - 94½	93½ - 94½	94½ - 95½

INDIA.—The subjoined table shows the variations which have occurred in the securities of certain leading Indian railway companies during the last three months :—

	27th Mar.	29th April.	29th May.
Bengal and North Western .	130-134	130-134	130-134
Bengal-Nagpur Gua. 4 per cent. .	103-107	104-108	105-109
Bombay, Baroda & Cent. India .	156-161	158-163	160-164
Indian Midland 4 per cent. .	103-107	104-108	105-109
Madras Grntd. 5 per cent. .	132-136	132-136	135-139
South Indian 4½ per cent. Deb. .	138-143	138-143	138-143
Southern Mahratta 3½ per cent. .	106-109	106-109	106-109

FOREIGN COUNTRIES.—According to the report of Mr. F. E. Taylor, Statistical Secretary to the Imperial Maritime Customs, the foreign trade of China was greater in 1901 than it has been in any previous year except 1899. The value of the imports in 1901 is given as 262,302,918 Haikwan taels, against 211,070,422 in 1900, while that of the exports was 169,656,757 taels, as compared with 158,096,752 taels. With regard to the two staple exports of China, tea and silk, the former has for years been declining, and in 1901 the amount of black tea exported was smaller than ever recorded before, while there was a serious diminution in the exports of green tea. The silk trade did better, the crops being good and the cocoons of fine quality. Of Chinese imports cotton goods take the first place, and the imports of them in 1901 were valued at 96,651,199 taels, against 73,606,360 taels in the preceding year. Contrary to the tendency of recent years, there was a marked demand for the cheaper qualities, and the cheapness of certain American products enabled them in some cases to oust those of British manufacture, Japanese competition also making itself felt. It is comforting to note that Great Britain is still very far ahead of any other country in the share it secures of Chinese trade. Of the tonnage entering and clearing the Treaty ports in 1901, 54 per cent. was British, Germany coming next with 15½ and Japan with 11¼. All other foreign nations counted for only 5·8 per cent., the Chinese tonnage being 13·3 per cent. If the comparison be made on the basis of the tonnage dues paid, the result is :—Great Britain, 51 per cent.; Germany, 18·5 per cent.; Japan, 11·8 per cent.; all other foreign nations, 14·9 per cent.; and China, 3·8 per cent. The Customs revenue in 1901 largely increased in unison with the increase in trade, and reached the sum of 25,537,547 taels; in 1900, the amount was 22,873,986 taels. In Japan, according to a report by Mr. Lay, Acting Japanese Secretary to H.M. Legation at Tokyo, the imports were worth about 21¼ millions sterling, or nearly three millions less than in 1900, while the exports were valued at about

22 millions, an increase of $3\frac{2}{3}$ millions. So far as the United Kingdom is concerned, the imports fell off by over two millions, and the exports increased by £22,000. The United States obtained the largest share of the total trade—about 11 $\frac{3}{4}$ millions sterling, China followed with over seven millions, Great Britain with 6 $\frac{1}{2}$, Hong Kong and British India with nearly 5 $\frac{1}{2}$ millions each, Germany with £3,427,000, and France with £3,167,000. But if the trade with the whole British Empire be considered, it easily tops the list with nearly 18 millions, supplying about half the total imports and taking nearly a third of the total exports.

Our usual table of exchanges follows:—

	27th Mar.	28th April.	28th May.
Paris, cheques	25f. 17 $\frac{1}{2}$ c.	25f. 18c.	25f. 21c.
Berlin, sight	20m. 46pf.	20m. 48 $\frac{1}{2}$ pf.	20m. 49pf.
Vienna, sight	24kr. 01 $\frac{1}{2}$ h.	24kr. 01 $\frac{3}{4}$ h.	24kr. 3h.
Amsterdam, sight	12fl. 15	12fl. 13 $\frac{1}{2}$	12fl. 14 $\frac{3}{4}$
Madrid, sight	34ps. 87	—	34ps. 65
Lisbon, sight	41 $\frac{1}{2}$ d.	—	41 $\frac{1}{16}$ d.
St. Petersburg, 3 months	94r. 05	—	94r. 20
Bombay, T.T.	1s. 4d.	1s. 3 $\frac{2}{3}$ d.	1s. 3 $\frac{7}{8}$ d.
Calcutta, T.T.	1s. 4d.	1s. 3 $\frac{1}{16}$ d.	1s. 3 $\frac{7}{8}$ d.
Hong Kong, T.T.	1s. 9 $\frac{3}{8}$ d.	1s. 8 $\frac{5}{16}$ d.	1s. 8 $\frac{1}{4}$ d.
Shanghai, T.T.	2s. 5d.	2s. 3 $\frac{3}{8}$ d.	2s. 3 $\frac{3}{8}$ d.

AGRICULTURAL RETROSPECT.

UNITED KINGDOM.—Cold weather in the early part of May brought plant-growth practically to a standstill, a severe frost one morning in the middle of the month doing serious harm to both farm and garden crops. Milder weather brought the most serviceable rains we have had this season, which speedily effected an improvement in the appearance of the country, and the month closed with summer sunshine and warmth.

The Board of Agriculture, in exercise of the powers conferred on them by Section 4 of the Sale of Food and Drugs Act, 1899, have made the following regulation:—"Where the proportion of water in a sample of butter exceeds 16 per cent. it shall be presumed, for the purposes of the Sale of Food and Drugs Acts, 1875 to 1899, until the contrary is proved, that the butter is not genuine by reason of the excessive amount of water therein." The regulation extends to Great Britain, and came into force on the 15th May. Mr. Hanbury, in reply to a question from Sir E. Strachey, stated that he was aware of the prejudice done to the makers of genuine butter both in this country and the colonies by the sale, as milk-blended butter, of an article artificially loaded with 25 per cent. of water. The introduction of an authorised standard of butter would, it was hoped, if standards in such cases were to be of any real value, have the effect of preventing such an article being so sold; but should that not prove to be the case, further steps ought, he thought, to be taken without delay to remedy the injustice done to both British and colonial farmers.

At the Cork Exhibition, which was opened on the 1st of last month, a large space in the Industrial Hall and a considerable part of the grounds have been reserved for the Department of Agriculture and Technical Instruction for IRELAND, which has subscribed £4,000 to the general purposes of the exhibition, and is spending a further sum of £7,000 or £8,000 on its own particular share in the enterprise. During its two years of existence the department has done most of its teaching by means of leaflets and lectures. The Cork Exhibition has furnished it with an excellent machinery for supplying a number of useful object-lessons in industries subsidiary to agriculture, in agricultural processes, such as dairying, horticulture and forestry, and in technical instruction. The department's object is to give an exhibition of ideas rather than of products, and it hopes, by means of a series of tours conducted by agricultural and industrial experts, to give workers from all parts of the country a sort of "University extension" course in industry, agriculture, and technical science. The outdoor agricultural exhibits show a working dairy and model farm and school garden, and there are exhibits of the processes of fruit and vegetable drying. This division is intended to illustrate some of the features of intensive culture suitable to Irish conditions. There can be no doubt that, if Mr. Horace Plunkett's scheme proves to be as admirable in execution as it is in conception, the Cork Exhibition will give a notable stimulus to the development of Irish industries.

COLONIES.—The annual report for 1901 of the work of the official experimental farms of the DOMINION OF CANADA testifies to the useful character of the work upon which Dr. Saunders, the director, and his colleagues are engaged. In the work of the central farm, at Ottawa, seed selection has occupied a prominent place, as it is highly important that farmers in a new country should have some guide as to what are the best varieties to grow, and thus save the years of labour which would be involved in their having to find this out for themselves. As many as 107 varieties of oats were under trial in the test plots at Ottawa, last year, whilst 15 varieties have been discarded after trials extending over several seasons had shown them to be not worth the notice of cultivators. Two-rowed barley, six-rowed barley, fall wheat, spring wheat, peas, maize, turnips, mangels, sugar-beets, carrots, potatoes, and beans have been similarly dealt with, inferior varieties of seed being gradually eliminated and new varieties given a fair trial of some years' duration. The effects of ploughing-in green clover to act as a fertilizer—conveying into the soil the nitrogen which the clover plant is capable of obtaining from the atmosphere—were increases of 40 per cent. in the case of maize subsequently grown, and of 8 per cent. in the case of potatoes. In connection with the horticultural work at Ottawa a seeding apple orchard was begun last season, and 494 trees were planted,

most of them grown from seed of apples ripened at the station. It is hoped that from these seedlings a productive, hardy, late-keeping dessert apple of good quality will be obtained, as such a variety is much needed in Canada. Many new varieties of apples were obtained from different sources, some being root-grafted and others top-grafted. The American plums that have been procured are proving very useful, and there is now a large collection of named varieties growing in the orchard. A few sorts of great promise have already been obtained. New plantations have been made containing 111 varieties of currants, 218 varieties of strawberries, and 63 varieties of raspberries. A list has been drawn up of the best vegetables for farmers, embodying the results of five or six years' experiments. Trial crops of tobacco have ripened and cured well. The results of long-continued efforts to foster the cultivation of the awnless brome grass, *Bromus inermis*—not a native of England, but cultivated in this country under the name of Hungarian forage grass—in the more or less arid districts of the West, are regarded as most gratifying. Thousands of acres of valuable hay and grazing land are now being cultivated, where, but for this grass, there would be nothing but exhausted prairie. A study of the milking records of the dairy cows at Ottawa serves but to confirm conclusions already well established, such as that the percentage of butter-fat in milk, from morning or evening milking, is influenced by the comparative length of interval between the times of milking, that the richer milk is found to be produced after the shorter interval, and that where intervals between milking are equal, no appreciable difference appears to exist in either the quantity or quality of the milk drawn in the morning or in the evening.

From the estimate of the Government Statist it appears that the wheat crop of 1901-2 in VICTORIA has turned out even worse than was expected. The area harvested for grain is put at 1,753,164 acres, or 264,157 acres less than in the preceding year; and the yield, at barely seven bushels per acre, is reckoned to amount to only 12,113,712 bushels, or 5,860,186 less than the crop of 1900-1.

FOREIGN COUNTRIES.—In FRANCE the weather recently experienced has been the worst so far this season. The day temperatures have been abnormally low and night frosts have been common. All crops have suffered, but wheat and rye more so than oats. The wheats in many districts have turned yellow and are attacked by mildew. Rotation grasses are backward, and the prospects of the hay crop are not encouraging. Sugar-beets are satisfactory, except some of the later-sown crops. The Minister of Agriculture of the ARGENTINE REPUBLIC, in a statement communicated to the Minister of Foreign Affairs, says that foot-and-mouth disease has been non-existent in Argentina for many months. In the course of the last six months 630,000 cattle and one million sheep have been brought into Buenos Ayres for the consumption of the population without a single case of disease having been detected. During the same period Argentina exported to South Africa and Brazil more than 120,000 cattle and 28,000 sheep without the occurrence of any epizootic disease. The refrigerating establishments prepared in the same six months about 500,000 cattle and 2,500,000 sheep, which were all minutely inspected and found to be healthy. The Government declares that in the event of foot-and-mouth disease breaking out it would be the first to notify the fact by prohibiting the exportation of live-stock, being anxious to uphold the reputation of the principal source of Argentina's wealth. It is calculated that the farmers have more than five million young cattle ready for exportation.

Mr. Consul-General C. S. Smith, in his annual report on the agriculture of the ODESSA district, states that the harvest prospects for 1901, which were excellent, were not entirely fulfilled. In the district of Podolia and near Kieff the winter wheat was excellent, but the Dnieper district, which supplies the bulk of grain for South Russia, and contributes the largest part of its exports, was very unsatisfactory. The feature of the year was the crop of maize—which has never been equalled in South Russia, and enormous quantities were supplied for export. The following figures relate to the harvest for 1901 in the RUSSIAN EMPIRE:—The total area under cultivation was 219,070,401 acres, of which about 40 per cent. were under winter-sown crops, and 60 per cent. under spring crops. The yield of wheat was 11,463,576 tons, of rye 18,881,650 tons, of oats 8,919,695 tons, and of barley 5,143,388 tons. The result shows a decrease of 12 $\frac{1}{2}$ per cent. when compared with the harvest of 1900, and, for the whole Empire, must be considered as under average. The yield of oil-seeds was very poor during 1901. The British Consul at Novorossisk states that within the past three or four years the cultivation of the sunflower plant for the manufacture of oil-cake has been extensively adopted by the peasantry and farmers of the district. The industry, which it would appear is very remunerative, is rapidly increasing in proportions, and promises to still further develop before long. It is claimed that the sale of the oil-cake produced, in itself more than covers all the working expenditure of the mills. The stalks of the sunflower plant are used as fuel for driving the machinery, and the ash that remains gives from 25 to 30 per cent. of potash. Briefly speaking, it would appear that the sunflower seed when properly crushed gives 23 per cent. oil, 40 per cent. oil-cake, and 37 per cent. stalk. Writing on the culture of fruit in HOLLAND, M. Bellet, in the *Journal d'Agriculture Pratique*, states that the chief centres of the industry are the provinces of Zealand, Friesland, Drenthe, and Overijssel, where the commercial plantations amount in area to about 40,450 acres. About half the area is devoted to apples, and nearly one-fourth each to pears and cherries, plums covering only about 1,850 acres. In many of the orchards trees are grown alone, while in some gooseberries, currants, or raspberries are grown between and under the trees. The cultivation appears to be somewhat poorly managed. Planting is too thick; manuring is not judiciously carried out; the bark of the trees does not receive proper attention; and pruning is not done on the best system. The fruit is largely exported to Germany and England, partly in a raw state, and partly preserved in one way or another. The quantities sent to this country vary greatly. In one recent year we received only 52,000 bushels of apples from Holland, and in the next nearly 387,000 bushels, the range being from 23,000 to 134,000 bushels for pears, 34,500 to 149,500 bushels for plums, and 29,000 to 65,000 bushels for cherries. Considerable quantities of gooseberries and currants come to us from Holland, and a few strawberries.

LABOUR RETROSPECT.

UNITED KINGDOM.—The depression in the cotton industry continues, 16,000,000 spindles engaged in spinning yarn for the Manchester market, and employing 48,000 workpeople, having been working only four days a week for about two months. In the shipbuilding centres employment seems but moderately regular, and complaints continue about the absence of new work. In the iron and steel trades large orders are required to enable works to remain well employed, although branches affected by work for the Coronation were busy enough to warrant a curtailment of the Whitsun holidays.

Regarding the petition of employees in the Government dockyards for increased pay and improvement in conditions of labour, the Lords of the Admiralty have replied that they are unable to accede to the requests made. Shipwrights were reminded that their pay was increased in 1901, and the skilled and ordinary labourers were informed that no good reason had been shown for making any change, especially as 1s. advance was recently granted. A small concession was made to engine-fitter apprentices, and the draughtsmen's application is to be further considered. In future, in order to give the representatives of the various trades an opportunity of setting forth their requests, the several dockyards will be visited by officials of the Board of Admiralty regularly each year. The lock-out in the Stourbridge flint glass trade continues, both Messrs. Webb & Sons' and Messrs. Webb, Shaw & Co.'s glass houses being carried on by non-union labour. Mr. J. J. Rudge, the General Secretary, of Manchester, has invited all the manufacturers of the district, on behalf of the Society, to attend a meeting of masters and workmen to discuss the state of trade, and to consider suggestions for the development and improvement of the same.

COLONIES.—The State Premier of QUEENSLAND has despatched a letter to Mr. Barton on the subject of the pearl fisheries in Torres Straits, pointing out that the present aspect of things indicates the loss to Queensland of almost the entire pearling industry, owing to fishermen having licences from the Queensland Government being prohibited, under the recent Federal legislation, from employing alien labour for diving purposes. Negotiations have been on foot for the transference of several of the establishments to Meruka. A special agent has been despatched to report to the Ministry upon the position, and as to whether the exclusion of coloured divers will force those interested to become Dutch subjects in order to carry on the industry successfully. In VICTORIA, the unemployed question is becoming very serious, and petitions have been put forward for the establishment of labour bureaux in various centres. The Government are of opinion that the financial condition of the State does not allow of the starting of new public works. The Victorian Employers' Federation have issued a manifesto urging employers and capitalists to actively combat what they term "the experimental socialistic legislation" being forced upon them. Regarding the Factories Act, they say that while thoroughly in accord with factory laws dealing with sanitation, protection of life and limb, and like matters, they are distinctly opposed to undue Government interference in the fixing of wages and hours. They believe that the tendency of the so-called Conciliation and Arbitration Acts operating in New Zealand and New South Wales, and proposed to be introduced in Victoria, is to produce irritation rather than conciliation, and they call upon employers and producers to take joint action to ensure peace, security, and freedom from Government interference, so that both workman and employer may be left free to carry on their legitimate business.

On the subject of native labour, the report of the TRANSVAAL Chamber of Mines deals at some length, and what is reported is sufficient to remove all doubts of any serious difficulty being encountered in procuring an adequate supply in the future. An agreement has been entered into with the Government of SOUTHERN RHODESIA for the participation of mines of that country, if possible, to the extent of 12½ per cent. of the natives collected by the Association in the province of Mozambique. By this arrangement a uniform system of recruiting is secured, to the mutual advantage of the mines of both countries. The question of native wages was likewise dealt with, and a revised schedule was agreed upon, which will result in a material saving to the mines. At the same time, the rates fixed were reasonable, and will not, in the opinion of the committee, in any way interfere with the inflow of native labour. It is considered probable that, as the development of the industry proceeds, it will be necessary to go outside South Africa to complete the labour supply, and, with this contingency in view, representations were made to the High Commissioner with respect to recruiting in British East Africa Protectorate and the Uganda Protectorate, with a request for information as to the prospects of success in those quarters. So far as regards Zanzibar, the committee were advised that labour would be unobtainable.

INDIA.—The latest cable advices report an increase of 16,000 in the number on relief works and gratuitous relief, chiefly in Bombay Presidency. Persons relieved, however, are in a satisfactory condition. The increase in number is due to cessation of harvesting, and will continue until the monsoon bursts. Although prices show a tendency to rise, they are nowhere excessively high. Rain has been general, with quite a heavy fall in several districts of Burma and Bengal, but in Deccan and Central India only light. Mail advices from Madras say that the distress in Cuddapah is intensifying, crops having failed. Labour is also reported scarce. Work at the Kolar goldfields has been seriously interfered with by the drought, and practically all operations had to be suspended. The chairman of the Bombay Millowners' Association reported at the annual meeting that the prospects of the mill industry were more cheerful. The manufacture of yarn and cloth had been on a more extensive scale than in the previous year, when

the short time stoppages and plague combined detrimentally affected the mill interests. During the year under consideration they had felt the loss of many workpeople from plague; but, on the whole, not much machinery had been stopped from this cause. The chairman considered the outlook as considerably brighter.

FOREIGN COUNTRIES.—In the UNITED STATES, upwards of 145,000 men, miners, breaker boys and others, connected with the anthracite coal trade, struck work about the middle of the month for an advance of 10 per cent. in the rates paid for contract work, and an eight-hour day for those employed at a weekly rate of wages. Considerable unrest has prevailed generally in labour circles in the United States during the past month, a recent estimate, apart from the miners' strike, giving the number of workmen who have struck for higher wages, shorter hours, or other reason, as 120,000, a greater proportion being in the building and textile trades. Settlements were generally favourable to the men, owing to the activity prevailing in all branches of industry. The wages of 200,000 men, in the larger sheet and tinplate mills, have been fixed until July, 1903, by the adoption by the Amalgamated Association of the wage committee's report.

A *resumé* by the British Consul at Chicago of labour conditions in the United States, with particular reference to his consular district, contains many points of interest. The year 1901 was, he states, very prosperous for the wage-earner in all trades, as work was steady all through the year, the usual time of idleness having been much curtailed. In Chicago it is said to have been the best year since 1892, the year of the World's Fair, and while wages have been increased slightly since then, the cost of living has been increased and is still increasing enormously. Notwithstanding the prosperity there are still more than sufficient men in all lines, except at certain times of the year for labourers, and working men of all trades should be very careful about coming to Chicago. The demand for unskilled labour has been very good, owing to the activity in railroad building throughout the States. There have been few strikes. The machinists demanded a 10 per cent. advance and a nine hours' day, which demands were granted in nearly every case. The iron moulders struck for the abolition of the differential scale of wages paid to bench and floor builders, and demanded 12s. 4d. per day instead of 10s. 3d. and 11s. 5d. The employers offered 10s. 10d. and 11s. 7d. which was refused, and most of the employers acceded to their demands. As a rule wages have remained the same as in 1900. The average annual earning of skilled workmen in Illinois is estimated at £118. 7s.; women £50. 15s. 7d., and children under 16 £34. 9s. 1d. The cost of living is very high. Skilled workmen pay from £2 to £5 per month for their flats or houses. *Dun's Review* places the cost of living at £20. 19s. per head, per year, for the necessities of life, a rise of 6 per cent. during the year, of 40 per cent. since 1897. These figures are the average for the United States, and expenses are, probably, at least 20 per cent. higher. This year the working men made probably a little more than the average given, as the work was steadier than usual. The increase in the number of men employed in the Chicago factories in the year is 9 per cent.; women, 16 per cent.; and children under 16, 39 per cent. There are now 19,839 children employed in the factories. A very great deal of work is done by piece-work, and it is very difficult to arrive at accurate figures of wages earned in the different trades, as in small shops non-union men work much cheaper than in large shops, where they are working with union men and get almost union wages. In some factories machines are run by boys earning 2s. 1d. per day, but about 7s. 2d. is the basis on which the calculations for piece-work in many machine and other shops are made. Machinists earn from 7s. 2d. to 11s. 3d. for nine to ten hours per day; iron moulders, from 7s. 3d. to 12s. 4d. for 10 hours per day; carpenters, from 9s. 3d. to 14s. for eight and ten hours, but in comparing wages the cost of living must be considered as well as broken time. In the sweating shops and shirt-making shops the wages paid are very small. In the tailoring trade union and non-union contractors are paid as follows: trousers, 3s. 1d. and 2s. 3d., and vests, 2s. 8d. and 1s. 10d. The union workers are paid: trousers, operators, 9d. per pair; pressers, 7d.; trimmers, 4d.; finishers, 7d.; vests, operators, 7d.; basters, 6d.; pressers, 4d.; trimmers, 2d.; and finishers, 1d.; and the wages earned are about 42s. per week for union, and 25s. 2d. for non-union shops. The American workman, as a rule, goes home and does not spend much of his time in the drinking saloons, while very few take an interest in sport, or bet on horse-racing.

Writing with regard to the agricultural strikes which have lately occurred in ITALY, the British Consul says that these disturbances, which have greatly inconvenienced agriculturists during the past year, are a novel feature. These strikes began to break out in the spring, and were directly due to the operation of the bodies which have existed for some years past in the large towns under the name of Camere di Lavoro (Chambers of Labour), and have conducted strikes almost in every industry. Until the last year their action had been confined to the industrial centres, but they have extended their operations to the rural population, and succeeded in creating Leagues of Resistance, as they are called, among the peasants. These leagues, at a critical moment for agriculture, either struck or threatened to strike work unless the landlords consented to modify the conditions under which the peasants occupied their holdings. The demands of the peasants referred chiefly to the rent at which the buildings occupied by them were estimated, and, in the second place, to the days of labour which, under their contracts, they were obliged to devote to the landlords at an almost nominal rate of pay. This latter point had acquired considerable importance from the fact that, in the course of time, abuses had undoubtedly grown up as regards the exaction of this obligation. The great majority of the landlords were willing to discuss the matter of rent and other minor questions which had been raised with their peasants, but they naturally objected to treat with the professional agitators from towns, who arrogated to themselves the right to act for the peasants. They were, however, compelled to waive their objections, and concessions were agreed upon under which work was resumed before cultivation had suffered any damage. There still remains, unfortunately, a general feeling of insecurity. A general and prolonged strike in the dairying branch of agriculture would threaten the existence of the very numerous and costly herd of milch cows which form so large a part of the riches of Lombardy and of the adjoining low-lying provinces.

SCIENTIFIC AND TECHNICAL DEPARTMENT OF THE IMPERIAL INSTITUTE.

MINING PROGRESS IN CANADA DURING 1901.

At the annual meeting of the Canadian Mining Institute Mr. B. T. A. Bell gave a report on the mineral development of the Dominion during 1901.

British Columbia.—This province occupied the leading position among the mineral-producing territories of the Dominion, the value of her mineral production in 1901 having increased from \$16,344,751 in the previous year to \$20,713,501. The value of the output in lode-mines showed an increase of about 40 per cent. and in coal coke, over 10 per cent. There was a decrease of 35 per cent. in the production of gold in the northern districts, due in the Cariboo district to a lack in the water supply.

In East Kootenay, lode-mining is largely confined to low grade silver-lead ores, and the market price for such has been so low that little or no profit is obtained. Relief from these conditions is hoped for by the establishment of a lead refinery now under construction. In West Kootenay, in spite of numerous labour troubles, there was a general increase in mineral production.

Yukon Territory.—While there was a shrinkage in the value of gold production, the progress of mining in the Yukon has been entirely satisfactory, the total output during the past year being estimated at \$18,500,000 compared to \$28,000,000 in 1900. During the last five years gold to the value of over \$73,000,000 has been produced. Mining has assumed a condition of much greater stability than prevailed during previous years. Some of the richest spots on Eldorado and Bonanza Creeks have been almost worked out, but there still remain extensive tracts in the bottoms of valleys underlain by gravel rich in gold from which large quantities will be obtained for many years to come, but with the depletion of these deposits, which encouraged extravagance of every kind, the wealth of the country will depend on the lower grade ores, and it will be necessary to introduce more economical methods with better machinery and organisation. In 1898 the method of mining all the deeper gravels which are frozen from the surface down to the bed rock was, in winter, to pick down through the frozen wall and by means of fires to thaw the frozen gravel. The hoisting was performed by hand-windlasses and the gravel piled in dumps to be washed when the streams began to flow in the spring. As the ordinary rate of wage for labour of all kinds was \$1 per hour, this style of mining was very expensive and only the richest grounds could be worked at a profit. In the following year boilers were imported and the ground was thawed by means of steam or hot water, and steam power was also used for hoisting purposes.

The Commissioner, the Hon. J. H. Ross, in his report points out that the great requirement of the territory is cheaper transportation. Every reduction in freight rates, and the cost of living in the Yukon, makes possible the introduction and operation of a higher class of machinery and cheaper production of gold. At the present time ground that could not be worked at a profit a year or two ago can now be successfully mined, and it is confidently anticipated that large areas that have already been worked will soon be wholly re-worked at handsome profits. The expense, not only of getting things into the country, but of moving them from one place to another, has been enormous. He has endeavoured to aid in the cheapening of transportation by constructing a circle of roads connecting all the important mining creeks with Dawson, which is the centre of supply for the territory.

The output of coal at Rock Creek and Cliff Creek is estimated to have been about 5,000 tons, of a value at the pit of \$125,000; silver to the estimated value of \$125,000 was also won.

The total royalty collected up to the 1st July last year, after deducting the exemption allowed by the regulations, was \$2,192,645.41, of which \$596,368.03 was collected during the year ended 30th June last. Up to 31st July there were recorded 24,524 placer claims, 2,793 quartz claims, 16,573 renewals and re-locations, and 25,000 assignments of claims. Leases now in force to dredge for minerals in the submerged beds of rivers in the Yukon cover 270 miles. The total amount of revenue received by the Dominion Government from there up to 1st July, 1901, amounted to \$139,655.50.

In the North-West territories gold-dredging is emerging from the experimental stage, and gives promise of becoming a successful industry. Three dredges have been tried on the Saskatchewan, but only one has proved successful, and this not entirely satisfactory, owing to the weakness of the machinery.

Alberta.—The outputs from the collieries at Anthracite and Canmore were 14,742 and 88,499 tons respectively, as compared to a total of 98,000 tons produced in the previous year. The Lethbridge collieries of the Alberta Railway and Coal Company also show an increase in production amounting to 35,233 tons, the output for the year being 217,034 tons, as compared with 181,801 tons in 1900. The price of these coals f.o.b. at Winnipeg was 9.00 dollars for anthracite and 7.50 dollars for bituminous coal.

Assiniboia.—The production of lignite at Roche Percée showed an increase, it being estimated that fully 43,000 tons were consumed in Manitoba and the territories as far west as Regina. The price varied from \$2.60 at Melita to \$3.75 at Winnipeg.

Manitoba.—Of the large number of quartz claims that were taken up in 1898, 1899 and 1900, not more than fifty are to-day in existence, and little or no development has taken place in any of them.

Ontario.—The mineral industry in Ontario made satisfactory, and in some branches rapid, progress during 1901. The chief metals of the province are iron, nickel and copper. The production of iron ore last year amounted to 272,533 tons, as against 90,302 tons raised in 1900. The greater portion of the ore came from the Helen mine at Michipicoton. Search for other ore bodies has been active and energetic; prospecting with diamond drills has been carried on in the Iron Ranges. Three blast furnaces running steadily throughout the year made 116,370 tons of pig iron, valued at \$1,701,703, as compared with 62,386 tons, worth \$936,066, in 1900. Steel was produced to the amount of 14,471 tons, valued at \$347,280.

The nickel mines of the Sudbury region increased the quantity of their output by 25 per cent., and the value by 130 per cent. During the year the Mond Nickel Company at Victoria mines put their smelters in blast, and are now turning out an 80 per cent. matte by the Bessemer process. The bulk of the production, however, remains to the credit of the Canadian Copper Company, whose low grade mattes are ground, calcined, and re-smelted at the Ontario Smelting Works erected by Colonel Thompson, of the Orford Copper Company, which came into operation last year. A noticeable feature of the year was the opening of the Creighton mine in the south-west corner of Snider township, from which 500 to 600 tons of ore are being shipped daily to the smelters at Copper Cliff. This mine has every indication of being an enormous deposit. The Manitoulin and North Shore railway, extending westward from Sudbury, serves this mine as well as several other nickel properties, two of which—the Gertrude and Elsie—are owned by the Lake Superior Power Company. The yield of precious metals was somewhat smaller than in 1900, 14,293 ounces of gold, worth \$244,443, as against 18,676 ounces, worth \$297,861, the previous year. The Mikado, Sakoos, and Sultana mines in north-west Ontario have remained steadily at work, and the Black Eagle, formerly the Regina, recommenced about the beginning of 1902,

with a new thirty-stamp battery. In Eastern Ontario, the Deloro and Belmont mines have been doing good work, and the production of arsenic at the former has greatly increased. The yield of silver was 151,400 oz., valued at \$84,830, as against 160,612 oz., valued at \$96,367, in 1900. Consolidation has recently taken place by which the West End, Porcupine, Badger, East End and Keystone mines have passed under the control of a new company. The output of non-metallic minerals showed a small increase in value over 1900. There was a decrease in petroleum, due partly to the natural diminution in the output, and a decrease in natural gas due to the stoppage by the Ontario Government of the export from the Essex Field to Detroit, which took place near the close of the year. Of cement there were 489,288 barrels made, and carbide of calcium to the value of \$168,792; corundum worth \$53,115, and arsenic worth \$41,677, were also notable products.

Quebec.—The production of *asbestos* was the outstanding feature of the year's mineral industry, the value of the output being estimated at about one million-and-a-half dollars, the largest in the history of the industry. Three modern and splendidly equipped milling plants were installed at Thetford mines, three at Black Lake, and one at Broughton. Seven companies operated all the year round, and three others intermittently, occupying about 1,500 men. The output of *chromite* was valued at \$50,000.

Nova Scotia.—Mining progress was chiefly remarkable for the continued expansion in the production of coal, coke, iron and steel. The total output of coal for the twelve months was in excess of 3,800,000 tons, an increase of 500,000 tons over the production in 1900, and very largely due to the Dominion Coal Company, which raised 2,561,783 tons as compared to 1,999,737 in 1900. This company delivered 863,633 tons to St. Lawrence ports; it exported 600,000 tons to the United States, principally for gas- and coke-making; and the balance of its production went to the Sydney steel works. The Dominion Iron and Steel Company has now its furnaces and converters working, and operations will shortly be conducted on a large scale. The Nova Scotia Steel and Coal Company have continued their regular operations at the Sydney mines pit, and have completed the construction of an up-to-date coking plant. They are engaged now in building a new shipping pier, and in opening the Lloyd's Cove seam. In Pictou County, the only development of note has been the opening of one of the Marsh seams by the N.S. Steel and Coal Company. The coke made amounted to 241,936 tons, to which the Dominion Company contributed 192,873 tons. The production of pig-iron was 137,807 tons, of which the Dominion Company made 111,014 tons, the N. Scotia Company the remainder. The latter company also made 25,678 tons of steel ingots.

Gold-mining in Nova Scotia has remained practically stationary, the output being 31,000 oz. The Richardson, Blue Nose, and Brookfield mines reported satisfactory yields. The most encouraging feature of gold-mining in the province is the preparation being made to open Dolliver Mountain district by an American syndicate. This lies in the same belt as the Richardson, and is believed to contain even larger beds of medium grade ore. An up-to-date mining and milling plant is being installed by the company. The exploitation of the copper ores of Cumberland and Colchester Counties is being continued, and a smelter of capacity of 25 tons a day is being erected at Wentworth.

The bounties paid by the Dominion Government on pig-iron amounted to \$351,259, on puddled bars \$16,703, and on steel ingots \$100,057.

The production of nickel matte was valued at \$627,080. Mica to the value of \$200,000 was produced by Ontario and Quebec. Iron ore to the amount of 553,003 tons was imported, of which Newfoundland supplied 418,130 tons, and the United States 100,154 tons.

THE MINERAL PRODUCTION OF CANADA.

Province.	Gold.	Coal.	Iron Ore.	Copper.	Lead.	Silver.	Pig Iron.
	Dollars.	Tons.	Tons.	Dollars.	Lbs.	Dollars.	Tons.
Yukon . . .	18,000,000	5,000	—	—	—	125,000	—
British Columbia	5,596,700	1,529,210	—	4,951,698	50,529,260	2,624,002	—
N.W. Territories	40,000	—	—	—	—	—	—
Nova Scotia . .	620,000	3,834,360	18,619	—	—	—	137,707
Quebec . . .	1,440	—	13,558	—	554,000	5,000	6,356
Ontario . . .	244,443	—	272,538	627,080	—	84,830	115,135
New Brunswick .	—	10,000	—	100,000	—	—	—
Alberta, Assiniboia and Manitoba . . .	—	370,275	—	—	—	—	—
Total . . .	24,502,583	5,748,845	304,715	5,678,778	51,083,260	2,838,832	255,198

QUEENSLAND COALFIELDS.

The output of coal in the State of Queensland amounted to nearly half-a-million tons during the year 1900, while that of New South Wales was over five million tons, and yet Queensland possesses immense deposits of coal much of which is superior in quality to that mined elsewhere in Australia, and the recent report on the Dawson and Mackenzie Rivers coal-field by Mr. B. Dunstan, of the Geological Survey, shows that this district will be able to supply a coal similar to Welsh steam coal, which should do much towards producing a prosperous coal industry in Queensland.

The coalfields at present worked are situated in the south-east of Queensland, and the most important in regard to output is the Ipswich (West Moreton) coalfield. The strata in which the coal-seams of this field occur belong to the Trias-Jurassic period and cover an area in S.E. Queensland of 12,000 square miles, extending southwards into New South Wales, where they are known as the Clarence Series. In these latter five seams are known to occur, but the coal is inferior and only used locally. In the vicinity of Ipswich eight seams outcrop, but as the strata are much faulted and folded, the extension of these in a workable condition is uncertain. The field is divided into a north and south part by the river Bremer, and though the same number of seams occur in each they have not been correlated. The principal seam in the southern field is known as the Aberdare, and has a thickness of 14 feet containing 12 feet of good coal. At the Aberdare colliery it is worked by three shafts at depths of 235 feet, 450 feet and 520 feet respectively, and shows a gradually increasing dip to the west, being about 25 degrees at West Moreton colliery, and the depth from the surface is 630 feet. North of the Bremer river the Eclipse or Bishop's seam, which attains a thickness of 8 feet in localities, has been worked at Waterstown.

In the Darling Downs district the Gowrie colliery works a seam of coal 5 feet thick at a depth of 50 to 80 feet below the surface. The strata are almost horizontal.

The Burrum coalfield extends from the mouth of the Kolan River to Noosa Head, but it is only in the township of Howard that coal has been worked. The country is flat and the seams seldom come to the surface, and the strata containing the coal-seams are covered unconformably by a more recent horizontal deposit of sandstone, clay or loam from 15 to 20 feet thick. The age of the coal-bearing strata appears to be intermediate between the Bowen River beds (Permo-carboniferous) and the Ipswich beds. They extend from the coast

for some 20 miles inland to near the sources of the Burrum and Isis Rivers, where, dipping at a high angle, they are altered in a series of micaceous schists and finally rest upon granite. The principal seams, in descending order, are :—

Bridge seam coal	2 feet 7 inches.
„ „ shale	5 „ 0 „
„ „ coal	3 „ 0 „
Shales, with three thin seams	220 „ 0 „
Torbanlea seam, 2 feet to 6 feet 2 inches, including a band 15 inches	4 „ 1 „
Shales	35 „ 0 „
Burrum seam	3 „ 7 „
Shales and sandstones	150 „ 0 „
Watson's seam	4 „ 0 „
Shales and sandstones	270 „ 0 „
North Hartley seam	4 „ 2 „

The Torbanlea mine lies 15 miles north of Maryborough and is connected with the North Coast railway. A shaft 400 feet deep opens up the Torbanlea and Burrum seams. The maximum output possible with the present machinery is 200 tons per day. The Riverbank colliery works a seam 3 feet 8 inches thick at a depth of 250 feet, and is supposed to be the united Burrum and Torbanlea seams. The Queensland Collieries Company's mines are situated at Howard and work the Beaufort seam, which lies probably above the Burrum seam. The output of the three mines in 1900 was 110,849 tons.

In the Central Queensland are the Clermont, Dawson and Mackenzie Rivers, Styx River and Collide Creek Coalfields, with the recently surveyed field of Hazledean.

Clermont is the present terminus of a northern branch of the Central Railway line whose junction is at Emerald; the distance between these two places is 62 miles. The coal-measures are best exposed at Blair Athol. They are probably not more than 500 feet thick, and include sandstones, carbonaceous and clay shales of the Bowen formation (Permo-carboniferous System). There are two seams of coal occurring within 100 feet below the surface. The upper seam, which is worked at the Hope, Imbell, Eldorado and Blair Athol collieries, is on an average about 4 feet 6 inches thick, and the unworked one about 15 feet thick, with 17 feet of measures intervening. The area of the field round Blair Athol is 5 square miles, and it probably extends over a much larger district. Taking a minimum area of 3 square miles and a thickness of 4 feet for the top seam, the quantity contained would be 11,000,000 tons, of which 7,000,000 would be available. The lower seam extends over a larger area; about 5 square miles. Calculating on a thickness of 12 feet, it must contain 56,000,000 tons, of which 37,000,000 would be available, giving a total minimum quantity of 44,000,000 tons available.

The Dawson and Mackenzie Rivers District.—In the recent geological survey of the Dawson and Mackenzie Valleys, it has been shown that an immense area on either side of the Central Railway line to the North and South contains coal-measures of great economic value. Of the 7,000 square miles of country that have been examined, there are about 5,000 square miles that are possibly coal-bearing, and this area may extend to the Western Railway in the South and to the Isaac River in the North. In the area of 5,000 square miles of coal-bearing country, outcrops of anthracitic coal occur in two localities about 100 miles apart. These localities are not on the same general strike of the measures, but the regularity of the strata between the two outcrops would indicate the probability of coal existing as a continuous seam or seams between them.

The country examined is embraced in the Leichardt Division, the whole of which is drained by the Fitzroy River and its tributaries. The coal-measures belong to the Lower Bowen formation. Below are the Lower Marine and Volcanic series, and above, the Upper Marine series on which lie the Upper Fresh Water series. The anthracitic coal is found outcropping just south of Dawson Island. The seam here is about 10 feet thick. At Jellinbah, the coal is exposed in the bed of the Mackenzie River. The seam appears to be almost horizontal and to have a thickness of 20 feet. The coal-measures are undulating. Prospecting is being carried on in the vicinity of the Central Railway, with the hope of supplying it with coal from these measures. A shaft sunk in 1900 to test the coal away from the outcrop shows the seam to fully maintain its thickness and quality.

The Styx River Coalfield, (Brooa Sound).—The area covered by this coalfield is drained by the Styx River and its tributaries. The coal-measures cover an area of about 156 square miles; about 26 miles from north to south, with an average width of 10 miles. Their most southerly point is on Stockyard Creek, about 12 miles W.N.W. of Marlborough. The district is generally flat and is covered with deep soil and alluvium. The formations are: 1st, Recent Alluvium; 2nd, Recent or Post-Tertiary Conglomerate; 3rd, Desert Sandstone (Upper Cretaceous); 4th, Mesozoic Coal-measures (Jura-Triassic); 5th, Permo-carboniferous beds. The thickness of the coal-measures in the neighbourhood of Tooloomba and Deep Creeks is 5,000 feet. These rocks overlie the Permo-carboniferous beds unconformably. The dip of the strata varies between north and east from 0° to 45°. The following seams are known and have been worked to some extent.

The Styx River Coal Company's Seam, Tooloomba Creek, is 2 feet 7 inches thick, and lies at a depth of 74 feet. The coal is hard, burns freely, and leaves a white ash. The Deep Creek Coal Seam was found outcropping in the bed of the river so named. It is reported to be 4 feet thick and to be a hard, compact, free-burning, bituminous coal. The Broad Sound Coal Company's Seam is 6 feet 11 inches thick with a band of clay shale 8 inches thick, and a clay band 1 foot 4 inches thick.

Collide Creek.—This locality is about 52 miles from Gladstone. The coal beds are believed to be of the same age as the Ipswich formation, and the seam is 30 feet thick as far as the shaft was sunk. The coal is without bands and the beds dip slightly to the north-east. A railway is to be constructed from this place to Port Gladstone, a distance of 68 miles by the proposed route.

Mackay District.—In a report on the geology of Hazledean Mr. B. Dunstan, Assistant Government Geologist, deals with the mineral resources of the district. Hazledean is situated on the top of the range dividing the waters of the Pioneer River, which enters the Pacific Ocean at Mackay, from those of Funnel Creek, a branch of the Isaacs River, which empties into the Fitzroy and this into Keppel Bay. Hazledean is about 24 miles direct south-west of Mackay. It is reached by train to Eton and thence by coach along the Nebo road. From Mackay to Eton the country traversed by the railway is slightly undulating and made up of recent alluvial deposits covering coal-measures. The coal-measure outcrops occur in many places above the alluvium, and the coal seams which are exposed on the surface have been prospected to a greater or less extent. These strata are also found in the district of Hazledean and are its oldest sedimentary rocks. They are separated from those of the plain by granite, and, as this separation continues generally in both northerly and southerly directions for many miles with the same difference of altitude, the eastern side of the granite masses is probably a slope down which the coal-measures on the coast side have been faulted. Those on the range have a general westerly inclination. The shales are frequently fossiliferous, containing "Phyllothea" and "Glossopteris." The thickness of the coal seams in every case is not an encouraging feature, as of all the seams examined so far the surface indications show none are over three feet thick. The measures have been much disturbed, and those seams which were unweathered appeared to contain a large percentage of ash. The total thickness of the measures at Hazledean is over 1,700 feet, and the age was placed

by Mr. Maitland in 1889 as Permo-carboniferous. Recent work has shown they are equivalent of the Lower Freshwater (B) series of the Lower Bowen Formation. Where the coal-measures are close to the granite on the range at the heads of Black Waterhole and Kemmis Creeks, they are intruded into by dykes of this rock and diorite. On one line of such intrusion there are veins of auriferous quartz. Alluvial deposits are of limited extent, but are generally auriferous. It is only at Mine Creek, however, that they have been found to contain gold in payable quantities, and then only in small patches. While there has been no attempt made by prospectors to determine the character and quality of coal at Black Waterhole creek (a branch of the Pioneer), the gold deposits have received considerable attention, but, though gold has been obtained, the general indication is that the quartz leaders are very poor in that metal.

Hampden—is situated about 20 miles N.W. from Mackay on the coast road to Bowen at the crossing of Constant Creek. The sedimentary formations of the district have been considerably disturbed by intrusive rocks, and the coal-measures which exist here have been contorted and faulted by these dykes where they have been penetrated by them. A shaft sunk in the district to 67 feet passed through three seams of coal. The first was penetrated at 16 feet and contains two feet of inferior anthracite, containing from 21 to 29 per cent. of ash, and 66 to 71 per cent. fixed carbon. At 60 feet depth a seam 5 feet thick occurs of a similar quality to the above.

Mount Toby—is $4\frac{1}{2}$ miles north of the railway terminus at Mirani. There are several seams of coal in the district, but while the thin seams are of good quality, the workable seams contain, as far as is known, only inferior coal. An analysis of the former gave water 6.3 per cent., vol. hydrocarbon 34.3 per cent., fixed carbon 51.8 per cent., ash 7.6 per cent. Further exploratory work is desirable.

The occurrence of limestone, strontianite and graphite in this district is also mentioned.

North Queensland.—Many large seams of Palaeozoic age have been found on the Bowen River, but they appear to have been much injured or destroyed by volcanic outbursts. The Kennedy (5 feet $5\frac{1}{2}$ inches?), Garrick (3 feet 4 inches), and Daintree seams all outcrop on the Bowen River.

Cooktown.—There are several outcrops of coal in the Little River, Oakley Creek and others, but the seams are of small thickness.

ANALYSES OF QUEENSLAND COALS.

	Moisture.	Volatile Hydrocarbons.	Fixed Carbon.	Ash.	Sulphur.		
<i>Ipswich Coalfield:</i>							
Aberdare Seam, Blackstone	1.74	33.10	60.64	4.52	.742	Queensland International Exhibition Exhibits, 1897.	
New Chum Seam, Whitewood Colliery	2.07	30.50	64.13	3.30	.811		
Braeside Bundamba No. 4	1.15	31.20	59.10	8.55	.592		
Bishops Seam, Bishops Colliery	1.15	24.75	72.69	1.41	1.01		
<i>Burrum Coalfield:</i>							
Beaufort Seam	—	29.8	62.2	8.0	—	Sp. Gr. 1.27	
Burrum Seam, Torbanlea Colliery	2.75	28.00	65.55	3.25	.45	W. H. Rands, Government Geologist.	
Torbanlea Seam (bottom coal)	2.00	28.00	61.60	8.0	0.4		1.31
Do. (top coal)	2.25	29.15	66.50	2.10	—	1.26	
<i>Clermont Coalfield:</i>							
Imbell	5.69	32.30	57.18	4.83	Trace	1.43	
Mercer	4.51	26.24	59.17	10.08	do.	1.33	
Eldorado	5.39	34.16	55.72	4.28	do.	—	
Hope	5.61	30.60	59.73	4.06	do.	—	
<i>Dawson-Mackenzie Coalfield:</i>							
Dawson Is. (mean of 7 analyses)	3.75	12.98	78.45	4.84	—	1.42	
Jellinbah, Mackenzie River	2.05	16.74	75.32	5.79	—	—	
<i>Styx River Coalfield:</i>							
Deep Creek Seam	1.75	31.19	60.36	6.30	0.40	1.298	
Styx River Coal Co.'s Seam	1.30	30.05	64.96	3.40	0.26	W. H. Rands.	
Broad Sound Coal Co.'s Seam	1.75	28.86	66.76	2.00	0.63		—
Do. middle band	—	30.35	60.15	9.50	—	Dr. Storer.	
<i>Collide Creek Coalfield:</i>							
Do. No. 2 Shaft	8.40	24.49	57.36	9.50	0.25	W. A. Dixon.	
Do. „ 4 „	9.95	23.63	54.20	12.04	0.18		—
Do.	9.510	26.365	59.850	4.275	—		—
<i>Bowen River Coalfield:</i>							
Kennedy Seam	1.12	41.81	42.79	14.28	—	1.463	
						J. Cosmo-Newberry	

A NEW FORM OF PHOSPHATIC MANURE.

The chief forms of phosphatic manures which are at present in common use are: (1) the superphosphate; (2) the finely-powdered natural phosphates; and (3) the well-known basic slag or Thomas phosphate powder. These differ considerably in character and properties, so that, as would be anticipated, they each produce their best results on soils belonging to a particular class. The superphosphate, which possesses an acid reaction, has almost the whole of its phosphate present in a form readily soluble in water and is most suitable for application to land containing plenty of lime. The natural phosphates are neutral and the basic slag slightly alkaline, but both contain their phosphates in a form which is only slightly soluble in water but soluble to a certain extent in weak solutions of vegetable acids. On certain soils, notably upon sour land deficient in lime, these insoluble phosphates have given excellent results, and probably owe their action to the neutralisation of the vegetable acids present in the soil and the consequent solution of some of the phosphate. The drawback to their use is the slight solubility, which renders very fine grinding essential if the material is to prove of value, and even then not more than half of the contained phosphate will be available as food for the crops. Recently a new form of alkaline phosphatic manure, in which this difficulty is overcome, has been suggested by Mr. J. Hughes, and in a paper read before the Society of Arts (*Journ. Soc. Arts*, Vol. L, p. 356), he furnished the following particulars of this.

It is produced by mixing ordinary acid superphosphate with finely-ground or slaked lime in such proportions that the product has a distinct alkaline character and, at the same time, contains from 25 to 27 per cent. of phosphate of lime readily soluble in a weak solution (1 in 1000) of citric acid. It has been named "basic superphosphate," since it combines the alkaline character of the basic slag with the ready solubility of the superphosphate. In mechanical condition it is superior to both; it is more than twice as bulky, weight for weight, as basic slag and much drier than superphosphate, containing only 4 or 5 per cent.

of moisture instead of the 14 to 18 per cent. usually present in the latter, so that its uniform distribution can easily be effected. Its average composition is shown by the following analysis :—

Moisture (lost at 100° C.)	4.15
Combined water and loss on ignition	12.86
*Phosphoric acid (total)	13.60
Lime	35.15
Sulphuric acid	28.50
Oxides of iron, alumina, magnesia, etc.	2.34
Insoluble siliceous matter	3.40
	100.00

*Equal to phosphate of lime 29.68

The manure, therefore, furnishes fully 10 per cent. more lime than ordinary superphosphate, and its superiority over basic slag in point of solubility is illustrated by the following figures :—

Solubility in Cold Water after 48 hours. 1 part Manure to 1,000 parts Water.			Solubility in Citric Acid Solution (1 in 1,000) after 24 hours. 1 part Manure to 1,000 parts Solution.		
	Basic Super-phosph.	Basic Slag.		Basic Super-phosph.	Basic Slag.
Percentage dissolved	66.80	6.60	Percentage dissolved	94.20	38.80
Containing :—			Containing :—		
Lime	22.28	4.70	Lime	34.73	22.17
Phosphoric Acid	none	none	Phosphoric acid	12.45	8.70
			Equal to phosphate of lime	27.18	18.99

The basic superphosphate is, therefore, ten times more soluble in water than a good finely-ground basic slag, and if the figures for the solubility in a weak solution of citric acid be compared, as representing more nearly the amount of available plant food in the two cases, it will be seen to be much superior. It is much more soluble, yields more lime and phosphoric acid to the solvent, and, further, out of a total content of phosphate equal to 29.68 per cent. of phosphate of lime, an amount equal to 27.18 per cent. was dissolved. The sample of basic slag used contained 38.97 per cent. of phosphate of lime, and of this an amount equal to 18.99 per cent., or less than half, was dissolved. The basic superphosphate must, therefore, be regarded as superior in fertilizing power to ordinary basic slag, and is specially recommended as a quick-acting phosphatic manure suitable as a spring dressing for crops grown upon soil containing less than 1 per cent. of lime. It will not take the place of ordinary superphosphate upon soils containing plenty of lime, or that of well-ground slag on damp, sour land, but on the above-mentioned soils, which represent a large area of the cultivated land in the United Kingdom, it should prove a useful and valuable fertilizer. During last season, 1901, the new manure was tried in many parts of the country, and the results of these practical tests have fully confirmed the favourable opinion founded on the laboratory experiments.

CULTIVATION OF VANILLA IN GERMAN EAST AFRICA.

The current number of *Der Tropenpflanzer* (April, 1902), the organ of the German Colonial Economic Committee, contains an interesting article on this subject by Herr Blitzner, a planter who has grown vanilla in Africa, and who has had considerable experience in the preparation of this material for the European market. The object of the article is to extend the cultivation of vanilla in such German colonies as the Cameroons and Togoland, and for this purpose full information on the question of choosing suitable localities for the plantations, the artificial ripening of the pods in inclement weather, and the proper packing of the commodity for export to Europe are given, and may be commended to English planters in tropical colonies where vanilla cultivation is possible.

Of the various species of plants yielding vanilla the one giving the best results is *Vanilla planifolia*, which begins to bear usually in the third year after planting and yields from 3 to 5 crops. It flowers in East Africa from August to November and bears fruit from April to July, the latter requiring about eight months to ripen in normal weather, and a further two months for drying and fermentation. For a plantation of about 10,000 plants, 15 labourers are necessary, and the wages of the latter on the East Coast of Africa are about 3½d. per day each. In forming a vanilla garden special attention should be paid to the selection of a site protected from wind, shaded by trees from the direct heat of the sun, and in the neighbourhood of a stream which is not dried up in the hot weather. The importance of the latter is obvious when it is remembered that the roots of the plant only penetrate about twelve inches into the ground and, therefore, obtain water only from the easily dried surface soil. For this reason it is necessary to have a good supply of water for irrigation in dry weather. The plants are arranged in parallel rows about five feet apart, passages being left at intervals of about 45 to 50 yards to permit of regular inspection of the plants. As supports for the orchids poles of ebony are sufficient in situations where there is sufficient natural shade, but, if the latter is deficient, then *Jatropha curcas* may be grown in the garden to afford both shade and support. It is usually best to place the young vanilla plants for about a fortnight in a well-shaded moist situation where they are kept well watered, and then to transplant them to the small pits about twelve inches deep already prepared with leaf mould for their reception in the plantation, the aerial portion of the plant being at once secured to the support by bast or banana fibre. The orchids should not be allowed to grow higher than about 5 feet, and when they reach this stage the heads should be carefully bent towards the ground. The plants require manuring with leaf mould or similar material once a year. The chief enemies of the vanilla orchid are beetles, snails and caterpillars, which eat the fleshy roots and young stems, the only remedy being the constant examination of the plants, and destruction of these insects, when they are found. The flowering period is an important time, since the plant, outside its native habitat, is not self-fertilising, and must therefore be pollinated individually by hand. This work, although rather a delicate operation, can be readily taught to negroes. In order to secure pods of good quality it is necessary to limit the fruit production of each plant to from 20 to 25, although in special cases the maximum limit may be 35; if this number be exceeded the ripe fruits suffer in size, appearance and flavour. Ripeness of the fruits is indicated by the formation of a yellowish patch at the base, and at this point they should be gathered by breaking the attachment to the stem cautiously with the finger nail.

The operation of curing the ripe pods has an important bearing on the quality of the vanilla ultimately obtained, and great care has to be exercised in the carrying out of the drying and fermenting processes. The pods, after gathering, are sorted on the following day into about three sizes, and placed in large pots warmed to about 80° C by hot water for about 14 seconds, then packed in wool-lined boxes for a day, and finally dried with a linen cloth and placed in the sun on wool-lined trays for complete desiccation. In wet weather the exposure to the sun is dispensed with and the final drying accomplished by careful

heating in ovens kept at temperatures between 80° and 100° C. The prepared pods are then stored in drying rooms and finally in large metal-lined boxes.

The preparation of the finished vanilla for the market, consists in sorting it into various qualities according to its appearance, size of pods and flavour. The pods of the same quality are then tied into bundles of about 50 to 60 each, secured with fine twine and packed into well-closed zinc- or parchment-lined boxes, capable of holding from 10 to 12 lb. of the product.

THE FERMENT OF THE TEA LEAF.

Although the change of the moist green tea leaf into the dried leaf with a coppery reddish black colour is one of the most important operations in the manufacture of black tea, and requiring the greatest care; yet the causes bringing about and influencing this change are not known with any certainty. Almost the only investigations made, until recently, were by Mr. Bamber, who, by several experiments, showed fairly conclusively that in some way or other the change was a matter of oxidation; for instance, no alteration was observed in the green leaves when they were kept in an atmosphere of carbon dioxide or in a vacuum, and the action of pure oxygen was found to be more rapid than that of air, although the resulting infusion was the same as that from the leaves exposed to air. It was also shown that bacteria or living organisms could have no agency in the change, because the leaves could be fermented equally well at 73° Fahr. (the usual temperature) as at 120° Fahr., at which temperature all germs would be destroyed. Solutions of such oxidising agents as potassium permanganate and hydrogen peroxide were tried on the leaves; but no appreciable effect could be noticed, the change proceeding in a perfectly normal manner. These results have recently been confirmed by other investigators, who have also attempted to isolate a ferment or enzyme from the leaves with varying success.

A report detailing the experiments made by Mr. Harold H. Mann appeared in the January and February issues of the *Tropical Agriculturist*, from which it would seem that he has isolated an oxidising ferment or "oxydase," accounting not only for the change in the nature of the leaf, but also for the character of the tea produced. The enzyme was prepared by digesting with cold water, for two hours, a thoroughly powdered mixture of tea leaves with half their weight of hide powder, which has the property of absorbing all tannin matters from the aqueous extracts; the clear filtered extract was then poured into alcohol, and the enzyme, which was precipitated as a white slimy mass, removed and re-dissolved in water. The estimation of the enzyme in water could be done colourimetrically by the production of a blue colour on the addition of a few drops of tincture of "guaiacum resin," the depth of colour indicating the proportion of enzyme present. The oxidising nature of the ferment was readily shown; thus, solutions of pyrogallol acid and of hydroquinone were rapidly oxidised in presence of the enzyme. It was found that all action of the ferment was stopped by heating to 130° Fahr., and further heating to 170° Fahr. was sufficient to kill the ferment in a few minutes; a 0.1 per cent. solution of sulphuric acid or a 3 per cent. solution of acetic acid or alkali was equally destructive; but, curiously, a faintly acid solution has an invigorating effect on the ferment. The proportion of enzymes in the different parts of the tea shoot have been examined, and it appears that the greatest amount is in the stalk and the unopened tip leaf; but as the unopened tip leaf contains nearly double the amount of acid, tannin and phosphoric acid that there is in the stalk, it is reasoned that the best tea results from a large amount of enzyme combined with the largest acidity and percentage of tannin. This theory is supported by the results of analysis of different grades of tea, it appearing that the flavour and general quality of the tea is directly proportional to the amount of enzyme in the leaf; it is noticed also that the percentage of phosphoric acid is greatest in the best grades. Mr. Mann reports the discovery that the effect of "withering" is to increase the amount of enzyme present by sometimes as much as 80 per cent.; also, together with the "oxydase" or active oxidising ferment, he finds a small quantity of enzyme generally present, which seems to take no part in the process.

One or two other investigators have recently reported the isolation of minute quantities of an oxidising ferment, but which they have not yet examined.

LUMINOUS BACTERIA.

Several species of bacteria have been found to possess the power of emitting light under certain conditions and, as the phenomenon presents many points of interest, the results of a recent investigation by Dr. J. E. Barnard (*Nature*, Vol. 65, p. 536) may be briefly recorded. The number of such species hitherto isolated is about twenty-five, but it is extremely probable that some of these are identical or, at any rate, very closely allied. They occur principally, if not exclusively, in sea water, and, although it is considered improbable that they produce any general luminosity of the sea, this may occasionally happen in the tropics where the conditions are most favourable. One organism in particular, the *Photobacterium Indicum*, forms a surface pellicle in artificial fluid cultures, which is very luminous, and this may at times be the cause of luminosity on the surface of the sea. The emission of light by a unicellular organism such as a bacterium is, in itself, remarkable, since there is no evidence of any special structure in the cell, and there is the further point that it is apparently, unaccompanied by any evolution of heat. The production of light, like that of heat in other organisms, must be attributed to the vital activity of the cell, being always accompanied by absorption of oxygen and evolution of carbon dioxide, but at present no explanation can be given of the fact that in these cases all the liberated energy appears as light.

In all marine light-producing animals the phenomenon is intermittent, being brought about by some external stimulus, and this may be so in the case of the bacteria, but, as the individual organism is not sufficiently luminous to be studied under the microscope by its own light, it is difficult to decide the point. A supply of free oxygen appears to be essential for continued luminosity, and in fluid media, where the oxygen in solution is quickly used up, means must be taken to replenish it, either by leading in a stream of the gas, when very brilliant effects are produced, or by frequent agitation. Agitation alone does not seem to be a direct exciting cause of luminosity, only serving to introduce fresh oxygen, and if the bacteria are kept perfectly at rest they will emit light as long as a continuous supply of oxygen is maintained.

Artificial cultures of the bacteria are best made on a medium containing a considerable percentage of a soluble chloride in addition to the usual nutritive material, for although they can be grown on ordinary media, all of them will not then emit light and none of them will produce their maximum effect. Any of the chlorides present in sea-water will increase the luminosity if added in suitable proportions, but the best results are obtained by adding to the culture medium 2.6 per cent. of sodium chloride, 0.75 per cent. of magnesium chloride and 3 per cent. of potassium chloride. The temperature at which the different luminous bacteria will grow varies considerably. Those found in northern latitudes will reproduce themselves and remain luminous at 0° C., but their optimum temperature, at which reproduction is very rapid and the emission of light is at its maximum, is about 15° C.; those from the tropics, on the other hand, will grow at much higher temperatures, but in no case is the optimum as high as blood-heat, 37° C. The light emitted by these bacteria was found to give a continuous spectrum which visually only includes the green and blue, the brightest portion lying between the lines F. and G., but photographs show a slight extension towards the violet. The cultures can be photographed entirely by their own light, they retain their light-giving power for long periods, and the luminosity is always greatest at those points where reproduction is taking place.

FORESTRY IN ASSAM.

The recently issued report on the administration of the forests of Assam during the year 1900-1901, contains some interesting information relative to the production of timber, rubber and other natural products during this period, and illustrates clearly the advantages to the State of reserving forest areas, in spite of the opposition often offered to such a policy.

The extent of reserved forest in this province was not increased during the year 1900-1901, the proposed extension of 104 square miles of land in the North Cachar Hills having been abandoned temporarily, owing to the existence in this area of numerous villages of hill tribes; in order to exclude these, it has been found necessary to restrict the area of the proposed extension to 34 square miles, which will be taken over as soon as possible by the Forest Department.

At the present time only the Goalpara division is systematically exploited according to a working plan, and here in the course of the year 3,420 sal trees were felled, against a proposed removal of 5,994, and 5,924 felled in the previous year. The timber of the sal tree (*Shorea robusta*) is in great demand in all parts of India, and last year the supply could not be met in Assam except by the sale of reserve stocks. The working of the forests for timber will be greatly facilitated by the use of a portable tramway which was recently purchased, and has proved so satisfactory that a 2½ mile extension of it has been sanctioned.

A portion of the well-known Charduar rubber plantation was again worked over this year, the trees in compartments 9, 10 and 11 being tapped for the first time, and about 100 trees in compartment 4 for the third time.

The former yielded on an average, 8·5 lb. per acre and 6·7 lb. per tree, as compared with 9 lb. and 6 lb. obtained in the previous year.

Tapping operations have also been carried out in the Kushi rubber plantation, where the trees tapped for the first time gave an average yield of 28·8 lb. per acre and 1·06 lb. per tree.

This remarkable difference in the yields obtained from the trees of the two plantations is accounted for, probably, by the greater age of the Kushi trees and by the better condition of the plantation, which is much more free from shrubs and creepers than the Charduar one.

The rubber was more carefully collected than in former years, special attention having been devoted to keeping it free from vegetable debris. The total yield from the two plantations was 3,775 lb. of dry rubber and 1,035 lb. of 'mat' rubber; the former brought in Calcutta 3s. 1d. and the latter 1s. 8d. per lb., whilst 3s. 7d. per lb. was obtained in London for the produce of the previous year. The net profit of the rubber-tapping operations was about £440, as compared with £456 in the previous year. An unsatisfactory feature of the Charduar plantation is the great falling off in the yield of rubber from the trees tapped for the third time; unless future tappings show that the trees recover themselves after a rest, the value of the plantation as a source of rubber is likely to rapidly diminish.

GENERAL NOTES.

OPAL-MINING IN QUEENSLAND.

Opals have been found in widely separated localities in the western and south-western interior of Queensland. They have been mined for in three districts which are about equidistant (roughly 500 miles) from the Pacific coast, and hundreds of miles north or south of one another. Opal-mining in such situations is a precarious industry, for in dry seasons water even for drinking purposes is not procurable within several miles of the mines. The work is carried on chiefly by adventurers who alternate this industry with sheep-shearing, kangaroo shooting, and job work on stations, and, if favoured with a moderate rainfall and fair luck, find the gem-mining highly profitable. The value of the opals obtained in Queensland from 1890 to the end of 1901 amounted to about £116,000. The gem itself is pronounced by experts to be unsurpassed for hardness and brilliancy, and has firmly established itself beside the best specimens of the Hungarian opal.

In the southern opal-fields near Thargomindah the gem is found in alluvial ground, but in the localities further north it occurs in the rocks of the ranges separating the water-course system. In these northern districts the veins or patches of opal are sought by sinking shafts, driving and open workings. No machinery is employed, and the gangue is brought to the surface in green-hide buckets. Owing to the exceeding remoteness of the opal-fields from the coast, and to the intermittency of the mining and the small scale of operations, little official attention has been devoted to the industry, and information respecting the occurrence of the gem is very meagre.

A tour of the opal-fields has been made recently by an opal buyer, and an account of his observations and experiences is given in *The Queenslander* (January, 1902). He found that operations are greatly hampered by lack of water. Since, however, there are valuable resources of subterranean water, he has suggested that the Government should provide wells. At Jundah, for example, where at present about forty men are engaged, it is computed that if three or four wells were constructed, access would be given to a large extent of country capable of supporting three or four hundred men. Under similar conditions, the vast district of Eromongella and Eromanga, which now supports 100 to 120 men, could employ 1,000 men. The importance of the opal industry is shown by the fact that there are thousands of miles of opal-bearing country in Western Queensland; owing, however, to the drought, the greater portion is as yet untouched.

ELECTROLYTIC SODA MANUFACTURE IN CANADA.

A considerable amount of attention has been devoted during the last few years to the application of electrolytic methods to the production of metal and chemical products, especially in countries possessing abundant sources of water-power, such as Switzerland and South Germany, where the electrolytic manufacture of alkali has been successfully established. In America, an alkali factory utilizing electricity developed by the Niagara Falls, has been at work for several years, and a new works has quite recently been started at Sault Ste Marie, in Ontario, to use power furnished by the Falls on the St. Mary's river at this point. A description of this Canadian installation was given by Mr. B. E. F. Rhodin at a recent meeting of the Canadian section of the Society of Chemical Industry, and is printed in the current number of this Society's *Journal* (April 15, 1902). At the present time the methods in use for the electrolysis of sodium chloride on the large scale are of two kinds, viz., those employing an electrode of quicksilver, which also serves the purpose of removing the metallic sodium as soon as the latter is formed, and so prevents recombination; and those depending on the difference in specific gravities of the solution of sodium chloride fed into the decomposing apparatus, and of the solution of soda formed by its electrolysis, which prevents the mixing of the two products.

The Canadian process attempts, with apparently considerable success, to combine the advantages of these two systems; it employs a mercury cathode and a series of gravity cells in which soda solution collects of a certain known density, and so produces, as is the case generally with the mercury process, a soda quite free from sodium chloride. The installation consists of 120 cells, with an output of 9 tons 241 lb. of bleaching powder, and 4 tons 565 lb. of caustic soda per day, an amount sufficient to cover the whole Canadian demand for these products at the present time. No particulars are given regarding the cost of materials at the factory, but the cost of electricity developed from the Falls amounts to 0·068d.

per lb. of soda made. In the discussion which followed the reading of this paper, Prof. Lang and Mr. Bain drew attention to the advantage held by the Leblanc and Solway processes of alkali manufacture over the electrolytic methods, since the former produced much less chlorine, and, therefore, did not tend to exceed the market demand for bleaching powder, as would soon be the case if the electrolytic methods came into extensive employment, in which case a lucrative source of profit would be cut off from the already much-reduced revenue of the alkali maker.

BAUXITE IN NEW SOUTH WALES.

This mineral, which is the chief source of the metal aluminium, has been found in several parts of New South Wales, and in 1899 three of the beds situated nearest to Sydney were examined and reported upon by the Government geologist, viz., the deposits at Wingello, Inverell, and Emmaville. The attention of American capitalists has recently been called to these deposits in a United States Consular Report, which also publishes the following analyses of several specimens of the mineral (*Engineer*, February 7, 1902):—

		Phosphoric Acid.	Alumina.	Ferric Oxide.	Silica.	Titanium Oxide.	Water.
Inverell	1	Small amount	31·43	27·03	15·01	4·98	20·38
	2	6·66	58·31	2·85	1·8	2·4	32·68
Wingello	1	Small amount	35·28	12·9	29·8	21·65	17·81
	2	" "	39·82	20·34	10·3	5·5	22·3
Emmaville	Red ore	" "	42·2	28·9	16	4·75	23·4
	Mottled ore	" "	47·84	13·59	16·4	1·77	19·2
	Yellow ore	" "	28·96	16·2	35·56	2·9	15·5

It will be seen that only one of these bauxites is of high quality, viz., the first Wingello ore, and if much of this mineral is available there the property ought, in the future, to prove very valuable.

MINERALS IN THE HIMALAYAS.

An article in a recent number of the *Pioneer* calls attention to the mineral wealth of the Himalayas, which has hardly yet been touched by mining engineers, and, in fact, has not been explored even by the Geological Survey of India. The mountains consist of a central range of gneiss and granite, exhibiting rock formations in many parts favourable to the existence of minerals. The sands of almost every river coming from the range contain gold, indicating the existence of gold-bearing reefs higher up. Graphite of excellent quality, and easily mined, has been found, as well as asbestos of good colour and long fibre.

It is well known that in the past copper has been extensively worked there, and copper-bearing rocks are found all over the Kumaon and Garhwal districts. Assays of copper and lead ores collected in Kumaon and Garhwal show a considerable amount of silver, and, occasionally, gold has also been obtained.

The climate of the Himalayas in the districts where minerals have been found is usually excellent, the land is fertile and labour is plentiful and cheap, while water-power is available everywhere. On the other hand, the transport difficulties are considerable, as all goods have to be carried by coolies, and any improvement in this direction can hardly be looked for until a large industry has been built up. The country is, however, well worth more attention at the hands of prospectors, and would probably repay systematic exploration.

THE FUSION OF QUARTZ IN THE ELECTRIC FURNACE.

The remarkable optical and mechanical properties of quartz make it a valuable material for the construction of physical apparatus, and there is no doubt that if a method of fusing it to a transparent solid, free from air-bubbles, could be found, it would very largely replace glass for the construction of prisms and lenses for optical instruments. A considerable amount of success has already been achieved in this direction by Boys, Shenstone and others, who have used, as a source of heat, the oxyhydrogen blow-pipe, and by this means have fused masses of quartz large enough for the construction of small prisms and lenses. Mr. R. S. Hutton, of Owen's College, Manchester, has recently observed in repeating some of Moissan's experiments with the electric furnace that, when finely-powdered quartz is heated in the latter apparatus with pure carbon electrodes, it is partially volatilised, but a portion fuses to a vitreous transparent solid, and he has found it possible in this way to prepare tubes and rods of quartz, the former being very useful for the investigation of the behaviour of gases at high temperatures. So far, fused quartz, free from air-bubbles, has not been obtained by this means, but it is quite probable that further experience of this process will lead to its successful production in masses sufficiently large for the construction of lenses, prisms, and other instruments.

THE ACTION OF SEA-WATER ON CEMENT.

The disintegrating action exerted by sea-water on cement exposed to its action has been made the subject of investigation by M. Le Chatelier, who communicated some of his observations to a congress on the testing of building materials, recently held at Budapest. (*Engineering*, April 11, 1902. 483). He finds that the magnesium sulphate contained in sea-water reacts with the calcium aluminate of the cement, producing a sulpho-aluminate of lime, which occupies a greater volume than the simple aluminate it replaces, and produces internal stresses in the cement structure by which the latter is slowly broken down. The obvious remedy, viz., the production of a cement free from calcium aluminate, was attempted by M. Chatelier, and he found that it was quite possible to replace alumina by ferric oxide, a cement of the composition 5 SO₂, Fe₂O₃, 17 CaO, being quite stable in the presence of soluble sulphates, and having, moreover, the property of hardening under water like ordinary cement. It was also observed that hydraulic mortars were stable in sea-water in inverse ratio to the percentage of lime contained in them, and that this stability could be increased by the addition of a portion of "puzzuolana" and that, also, concrete made from finely-ground cement lasted better than that made from coarser material, even when the latter was of satisfactory chemical composition.

Electric Storage for Automobiles.—A New York correspondent of the *Times*, telegraphing on the 28th ult., says:—It has long been known that Mr. Thomas A. Edison has been experimenting with a view to the invention of a storage battery to enable automobiles to run 100 miles without recharging. To-day Mr. Edison announced that he had solved the problem. As soon as a 5,000 miles endurance test, which is to be started next week, is completed, he will begin the manufacture of storage batteries for the use of automobiles, launches, and street cars. The experiments with the new motor already made have been highly satisfactory. It is understood that Mr. Edison's invention will also greatly decrease the weight of automobiles. Unlike some other American inventors, Mr. Edison is not in the habit of giving out premature statements regarding his successes. Apparently, therefore, the difficulty which has stood in the way of the general use of automobiles in the place of horses has been overcome, and an enormous increase in the use of motors may be expected.

LECTURES AND PAPERS.

"THE CONDITION OF THE PEOPLE OF INDIA."

(By J. D. REES, Esq., C.I.E.)

Lord ELGIN presided on the 10th March at a lecture given at the Imperial Institute by Mr. J. D. REES, C.I.E., late Member of the Viceroy of India's Legislative Council, on "The Condition of the People of India."

The chairman, in his introductory remarks, said the subject to be brought before the audience was one which, he thought he might fairly say, would appeal to everybody, for he did not think there would be anyone present who would like to profess himself indifferent to the condition of 300,000,000 of our fellow-subjects. It was also a subject of very great magnitude, very great complexity, and of very great difficulty to anyone who attempted to deal with it. He could remember very well that, when he went to India, one of the first things which impressed itself upon him was the great caution with which one ventured to apply any experience one had gained in this country to problems that arose in India. But in this particular subject, anyone dealing with it not only had to make an estimate of the conditions obtaining in India, but had also the great, and, perhaps, greater difficulty of translating those difficulties into language which would be intelligible to those who had never seen India. In order to bring home the facts of native life in India to this country, it was useless to ignore that one of the main difficulties that we had before us was to let people here understand what really were the wants of the people over in India.

To compare the conditions of life, the income and needs, of the Indian peasantry with those of similar classes in Eastern and Western Europe was, said the lecturer, a useless, and, indeed, an impossible task. He thought that, upon the whole, the Indian peasant, in ordinary years, was not in a much inferior position—when his wants and his means of supplying them were taken into consideration—to the peasant of Europe. The contrast was in wants. The peasant in Eastern Europe had fewer wants than the peasant of Western Europe, but considerably more than the Indian peasant; in fact, proximity to the tropics determined not a lower standard of comfort, but a lower standard of wants. The Indian peasant could feed and keep himself in good health, with grain and a few condiments, for a penny a day; he usually had free quarters, or accommodation at an almost nominal rental, and his expenses for clothes were but small. The British working man, on the other hand, had to pay from 25 per cent. to 40 per cent. of his earnings in rent, and his expenses for food and clothing were, of course, very considerable.

It was extremely difficult to teach the Indian peasant thrift. Under former rulers he had avowedly been allowed but enough for bare subsistence, and any margin our lower land-tax left him served but to enhance his credit with the money-lenders, and so contribute to his indebtedness. When the peasant grasped the idea of putting a penny by for a *rainless* day, a great advance would have been made; but the habit of centuries had not as yet been weakened. The question as to the improvement of the peasant's condition was one that could hardly be decided by statistics. Doubtless his nominal income had increased, but owing to payments in cash—instead of in grain, as formerly—and higher prices, he was probably not very much better off than before, except where he had profited by the local expenditure of British capital, and the establishment of some new, or the development of some old, industry.

Mr. Rees here quoted what a recent writer had said in describing the life of the North Indian peasant, male and female, "as one of ceaseless monotonous toil, a constant struggle to keep body and soul together, but one which enforces industry and temperance, and is compatible with a good deal of simple charity and kindness, and a ready cheeriness which can find amusement in the veriest trifles." The agricultural labourers, who were often described as one degree removed from destitution, did not suffer from want of food unless crops failed, and prices rose. The petty proprietors were poor, but their condition had largely improved in the last 30 years. The people would not emigrate in large numbers, and they would indulge in litigation. The State could only keep the poorest out of taxes paid by the poor. Meanwhile the middle and higher classes became richer, and, up till now, the Government had not, said Mr. Rees, got at their pockets to any great extent.

Indian agriculture, as had been said, presented "a perfect picture of careful cultivation combined with hard labour, perseverance, knowledge and fertility of resource," and no one else but a Chinaman could make a living off a Hindu's small holding. To suppose that the Government could raise the condition of the depressed classes was a dream; but by letting them, and their labour systems, alone and by creating and encouraging a diversity of occupations and industries, other than agriculture, the Administration could show them a way whereby they might obtain salvation.

One of their own eminent men, the late Mr. Justice Ranade, had pointed out to his fellow-countrymen the encouraging increase in the export of manufactured goods in recent years, which had been relatively greater than the rise in the export of raw produce. He had rightly attributed this change to the influx of British capital and enterprise, which he had considered a very hopeful sign in the already altered relations between Indian exports and imports of raw and manufactured goods.

There was no limit, Mr. Rees contended, to which this development might not extend in a country in which such vast stores of raw material existed alongside the cheapest, and by no means the least efficient, labour in the world.

What social form the people of India were likely to develop he did not know. Sir John Strachey, an experienced statesman, had written in 1899: "They are intensely conservative, and wedded, to an extent difficult for Europeans to understand, to every ancient custom," and "between their customs and religion no line can be drawn." Social reform from within, indeed, showed no such signs of development as industrial reform. The latter, the people, and the Government, of this country should be as anxious to promote as they should be unwilling, directly or indirectly, to interfere with the customs of the people, who were, it might be believed, slowly increasing in prosperity, notwithstanding the ravages of plague, pestilence and famine.

With regard to famine, Mr. Rees deprecated the action of some of the illustrated papers in emphasising the sufferings of the people instead of the great administrative achievements of famine relief. When the provinces which had never had famine, since the new Code had come into force, had all experienced one famine under its provisions, great mortality need no longer be expected; as it had been proved that the death-rate of a district, during a second famine under the new Code, was but little above the normal, owing to the people knowing how to avail themselves of relief. Grain was always now available, although famine prices were twice the ordinary ones. In the ante-railway days sixty-four times the ordinary prices had been a common increase. The financial prospect was, however, serious, for the expenditure entailed in relieving these periodical visitations was very great; and all were agreed that no new taxes should be imposed on the Indian, and it was idle to talk of using, for his relief, taxes collected from the British. Hence the importance of administrative economy.

Mr. Rees advocated the employment of Indians wherever possible, and deprecated forcing upon the people any expensive and scientific services of administration, for which they were neither ripe nor willing, but for which they would have to pay. He also urged that we should not be so willing to accept as authorities upon Indian religions, customs, and conditions, those who had adopted other standards and who, therefore, could but represent a small minority.

"HOME LIFE IN CANADA."

(By HAMAR GREENWOOD, Esq.)

Mr. HAMAR GREENWOOD, on the 17th March, delivered a lecture at the Imperial Institute entitled "Home Life in Canada." Colonel WILLOUGHBY WALLACE, Commanding the King's Colonials, Imperial Yeomanry, presided.

In the immense and bracing Dominion of the West the great characteristic of home and social life was, said Mr. Greenwood, freedom from artificial restraint. The great majority of Canadians were the descendants of those pioneers who first settled in the forests and on the prairies of the colony. These early settlers had started level in every sense, and the healthy idea of equality engendered by this shoulder-to-shoulder building-up of the country was still the dominant factor in Canadian life.

The majority of Canadians lived on farms; and in a farmer's household everybody, including the farmer, worked and worked hard. There was no strict line drawn between the members of the house and the hired man. That individual generally had his seat at the family table, and was treated and paid in a way that would startle an English farmer. But this condition of things, which was all the better for the hired man, who usually became a freehold farmer in the course of time, did no harm to the family, who generally believed in helping others up and not in holding them down. Canada was certainly a paradise for all those who had to start life from the ranks. They were treated with a consideration undreamed of in the old world, and this very consideration tended to fire them with the colonial enthusiasm "to get on," and get on they certainly did. Any man, or woman, who went to work on a farm in Canada would never be slighted or treated with contempt, but would receive every encouragement and be treated with every respect.

Owing to the admirable educational system of the Dominion, the boys and girls alike always found a good school at their very doors, and the rule was for the children of all kinds and conditions of parents to attend the same school. Co-education of the sexes obtained. In the elementary and secondary schools and in the universities the sexes worked together, a system which had developed a type of womanhood, and a type of chivalrous manhood that, said Mr. Greenwood, justified co-education for all time. The custom of sending all children to the same school "at the threshold" kept the home circle unbroken until the children had grown up and struck out for themselves. Parents and children saw a great deal of each other, and the word "home" meant more in such families than it possibly could in those where the youngsters "looked in" only during vacations.

During the winter months, when there was comparatively little for the farmer to do, the strong desire to get ahead often prompted people to attend the elementary schools to improve their education. The lecturer here instanced an occasion when one winter he had, in a village school, taught a farmer and his three grown-up sons, reading, writing and arithmetic. As was not unnatural, the sons soon made more progress than the father.

In Canada all churches were free, and all schools practically so; and there were no landed or other privileged classes. These facts tended to bring all conditions of people together in social intimacy. In the little village to which he had referred there was but one place of worship, which, on Sunday mornings, was used by the Methodists, in the afternoon by the Baptists, and in the evenings by the Presbyterians, and, with some few exceptions, the congregation in each case was the same. Every man, woman and child in a farming community frequently met together at some social gathering, especially if that gathering was in any way connected with the village school. Compared with English village life, life in a Canadian village, especially in the winter, the great social season, was a perfect buzz of sociability. The love of outdoor sports like tobogganing, skating and sleigh riding, further tended to bring people together. Nearly every town and village had its skating rink and there was no restriction of membership. All classes enjoyed this exhilarating pastime together. Healthy sport helped to keep down snobbishness and to build up not only vigorous men and women, but a broad-minded and sympathetic people.

In towns and cities conditions of home and social life naturally varied from those of the country districts. At the same time the quality of good fellowship and the "help-one-another" idea prevailed. The whole social system of Canada might be said to be built upon the idea that men or women should be treated according to what it was possible they might become.

The Canadians looked ahead, not behind. The great majority of the ruling men and women of Canada to-day were people of humble but healthy origin. The first Prime Minister was the son of a poor Scotch miller, the second started in life as a stonemason, the third as an office boy, the fourth as a clerk, and the fifth as a printer; all this tended to make the people look upon every boy as a possible Premier. There was in the Dominion no idea of "betters" where all were free to be best.

There was an old saying, in which there was much truth, that in every Canadian's home two books were always found: the Bible and the dictionary. No doubt the one accounted for the strong religious element in the home life of the country, and the other probably, in some degree, for the speaking capacity of the Canadians, who were born talkers. A Canadian home was, Mr. Greenwood contended, the happiest, heartiest home on earth. He also had a good deal to say about the hospitality of the people and their sense of humour, and altogether gave a most enthusiastic and attractive picture of Canadian home life: an account which, he hoped, might possibly induce some of his hearers to emigrate to that country.

Colonel Wallace, in proposing the vote of thanks for an interesting, but far too short a lecture, referred to the King's Colonials, Imperial Yeomanry, which he had the honour of commanding, and made some appropriate remarks as to the far-reaching results the assistance the Colonials had rendered in South Africa might be expected to have.

At the conclusion of the lecture a series of interesting cinematograph pictures, principally of farming operations in the Far West, were shown by Mr. J. A. Freer, who was on the point of returning to Canada after having visited many of the provincial towns of England, with his cinematograph, with a view to popularising Canada as a field for emigration.

"LIFE AND LEGEND IN RUSSIAN ART."

(By MRS. ROSA NEWMARCH.)

(ANGLO-RUSSIAN LITERARY SOCIETY.)

On May 6, at the meeting of the Anglo-Russian Literary Society, the President, Edward Cazalet, Esq. in the chair, Mrs. Rosa Newmarch read a paper entitled: *Life and Legend in Russian Art*. The paper gave a brief account of Russian art from the introduction of iconography, by the Greek monks, at the close of the tenth century, down to the most recent development of the realistic-national school. Passing over the purely imitative art of the eighteenth century, Mrs. Newmarch spoke of Alexander Ivanov (1806-1858) as the precursor of modern realism in Russian art. In his colossal picture "Christ appearing to the Nations," everything, even to the awkwardness of composition, showed an uncompromising desire for the truth. The genre pictures of Fedotov marked a further step in this direction. They were humorous comments upon the official and bourgeois life of the forties. Such pictures as "The Newly Decorated Knight" and "The Choice of a Bride" were pendants to the lighter works of Gogol. With the newly awakened social and political life of the sixties, sprang up a new school of painting and literature. These men regarded their art as a moral and educational force. They "went to the people" for their inspiration,

and in reflecting the national life they strove also to make their pictures a form of protest against existing evil. Perov, with his Hogarthian presentments of everyday life, was the leader of this "didactic" school; and Verestshagin, with his sensational exposures of the horrors of war, is closely allied to it. So also are Yaroshenko, Prianchnikov and Savitsky. Gradually the tendency to paint pictures "with a purpose" died out, and this literary school gave place to one in which instincts of form and colour took the first place, and the "purpose" became subordinate to emotion. Among this later generation of artists we may reckon Makovsky, Kranskoï, Schwartz—the Meissonier of Russia; Gû; Yakobi; Maximov and—perhaps the strongest and most racy of all—Repin, now President of the Academy of Arts. These men put us in touch with the national life of Russia, for they have reconstructed its past and reflected the present with astonishing truth and insight. Mrs. Newmarch also spoke of the effect of this realistic tendency on religious art, and wound up her paper with an account of the new iconography—the reconciliation of modern technique with ecclesiastical tradition—as exemplified in the decorative works of Victor Vasnetsov. The lecture was illustrated by about fifty limelight views of representative Russian pictures from the principal collections in Moscow and St. Petersburg.

After the reading of the paper Mrs. Henry J. Wood, accompanied by her husband, sang songs by Dargomijsky and Borodin. Miss Sandra Droucker, the great pianist, who has won a well-deserved reputation in St. Petersburg, played pieces by Scriabin; and the Russian tenor, Mr. Louis Arens, sang several most original folk-songs, and an air from Rimsky-Korsakov's opera "Sadko."

In returning hearty thanks to the talented lecturer and artists, who had so generously and splendidly entertained the numerous assembly, Mr. Cazalet referred to Mrs. R. Newmarch's acquaintance with Mr. Stasov, the famous Russian Art critic and director of the Imperial Public Library at St. Petersburg, where she carried on her literary researches. It was hoped that Mrs. Newmarch's book on Tchaikovsky would, ere long, be followed by other productions.

PROCEEDINGS OF INSTITUTIONS.

THE ROYAL GEOGRAPHICAL SOCIETY.

A meeting of the Royal Geographical Society was held on the 28th April, when Lord RONALDSHAY and Mr. EDWARD PENTON read papers on "A Journey from Quetta to Meshed, *via* the Nushki-Seistan Trade Route." SIR CLEMENTS MARKHAM presided.

Lord Ronaldshay said that, with a view to travelling over the recently-opened trade route between India and Persia across Baluchistan, he journeyed to Quetta at the end of October, 1900, reaching that place on November 1. Having engaged seven Indian servants and a daffidar and threesowars of the local levy from Nushki, as an escort as far as Meshed, he started his caravan of baggage camels on the 9th, and left Quetta himself on the 10th of the same month. After leaving the main road a few miles from the town, the route became a camel track running over flat stretches of sand and gravel, covered, for the most part, with brown tufts of aromatic wormwood, while low ridges of barren hills shut in the view on either side. Here and there small villages were to be found, consisting of mere clumps of low flat-roofed mud huts.

Sixteen miles beyond Quetta they passed the first of the levy posts, Girdi Talab, and another 16 miles brought them to the second, Karnak, where they camped for the night. These levy posts consisted of small mud forts, which exist, or are in process of construction, at intervals of from 15 to 30 miles, the whole way from Quetta to Seistan, and were held by a daffidar and a few sowars raised locally, who carried a mail-bag from post to post, thus maintaining the only communication that existed between Seistan and Quetta, a distance of 500 miles over the deserted wastes of Baluchistan. On the 13th they reached Nushki, which was only little more than a glorified edition of all the other villages, and consisted of some 200 houses, the population being about 250. It appeared to him that a line from Quetta to Nushki would be by no means an impossible undertaking, and, in the event of such a line being constructed, Nushki would undoubtedly become a large and flourishing place. It was far more suitable as a starting point and terminus to the caravan route than Quetta. Since he was there, sanction had been given for a survey to be made with a view to building a railway from Quetta.

Lord Ronaldshay described the route from Nushki, which he left on November 15, and remarked that the road, thanks to the energy of Captain Webb Ware, the officer in charge of the route, was in most places clearly distinguishable from the rest of the plain. The road led at times through ground broken by low ridges and mounds, at other times over great plains of black gravel, where vegetation all but ceased, and then again over stretches of sand, where tamarisk and dwarf palm grew, and very little in the way of human life was met with. A post at the foot of the Saindak mountains was reached on December 6, and the party proceeded in a north-westerly direction, by way of Robat, on the Perso-Baluch border, distant from Quetta 460 miles, and thence to Girdi Thana, a post recently constructed under the direction of Major Chenevix Trench, at that time Consul at Seistan. From this point, dotted all over the plain, were to be seen remains of ancient cities.

The last 20 miles, before reaching Nasratabad, the capital of Seistan, the whole face of the country changed, and, instead of a dry, waterless plain, it became a plain intersected with ditches and canals, and covered with low scrub jungle. Thus, the journey from Quetta could be performed with ease and comparative comfort; supplies were forthcoming at all the larger posts, and water and grazing existed for camels at every stage.

The climate in winter was, as a rule, fine and dry; the nights and the early mornings were cold, and there was a warm sun in the middle of the day. It was in winter that caravans at present travelled through this country. Lord Ronaldshay said that the capital of Seistan was a tumble-down, dilapidated mud city without roads. There had lately sprung up some neat buildings belonging to the British Consulate. The Ameer of Seistan, in conversation with Lord Ronaldshay, spoke with the greatest assurance of the advantage of a line from Quetta to Robat, which he looked upon as a certain production of the near future; and the lecturer said that he heard the advent of a line along the new trade route discussed with much more certainty by the higher-class Seistanis than he did at the Quetta-Nushki end of the route.

Though the merchandise which came along the route from India eventually found its way to many places far beyond Seistan, the actual trade route known as the Nushki-Seistan route was between Quetta and Nasratabad. Judging from the progress of the past the future prospects of the route were decidedly bright. The amount of trade which passed over it the first year it was taken up—1896—was a lakh-and-a-half. Since that time the trade had been steadily increasing, and showed returns for the years 1897 to 1901 of 5 lakhs, 12 lakhs, and 15 lakhs. At Quetta a caravanserai had been built near the station, and placed under the superintendence of a trustworthy native, for the use of traders coming from Persia, and a rebate of one-third was given on the railway freight of certain goods exported from and all goods imported into India through Quetta and Nushki. There was every reason, therefore, to suppose that, if the ultimate construction of a railway depended solely upon the increase of trade such a railway might be looked for in the not very distant future.

Lord Ronaldshay next described his journey, after leaving Seistan in the middle of January, 1901. Some of the country resembled very strongly the dry and arid wastes of Baluchistan. At the end of the month, Birjand, a great trading centre, with a population of 30,000, was reached. Leaving this place on February 4, the party travelled in a northern

direction over flat country, much of the land being ploughed. On the 5th they crossed the range in front of them by the Saman Shahi Pass, and, after some difficulties caused by bad roads, came to Gunabad, a large and fertile oasis. Beyond this stretched a vast and inhospitable plain, the crossing of which occupied two days. Another day, through mountainous country, brought them to Turbat-i-Haidari, whence a toilsome journey of some 80 miles, across mountain ridges covered with ice and snow, took him to Meshed, and the end of the caravan journey.

THE ROYAL AGRICULTURAL SOCIETY.

The usual monthly meeting of the Council was held on the 7th ult., PRINCE CHRISTIAN (President) in the chair. Thirty-seven candidates were admitted into the Society as members, and Mr. WHEELER reported from the Botanical and Zoological Committee that arrangements had been made for a conference on the 5th inst., with representatives of the Highland and Agricultural Society of Scotland, for the purpose of ascertaining whether it would be possible for the two national societies to agree upon a common line of action with reference to the general question of testing farm seeds, and upon a uniform method of testing seeds and reporting the results. SIR NIGEL KINGSCOTE presented a report which had been submitted to the Veterinary Committee by the sub-committee, appointed in July last, to supervise the experiments conducted at the Royal Veterinary College as to the possibility of infecting bovine animals with tuberculous material from the human subject. These experiments were carried out on a cow, two young calves, and two yearlings. In the case of the cow the tuberculous material was injected in the udder, in the calves it was given by the mouth, and in the yearlings it was injected into the veins. In the strict sense of the word it could not be said that the experiments proved the impossibility of infecting cattle with human tubercle bacilli, for at least, in the case of the cow, the human bacilli had multiplied in the body, and had induced a manifestly diseased condition. In the other cases, also, reactions to tuberculin after the attempt to infect with human bacilli would appear to indicate that infection had actually taken place. On the other hand, the absence of distinct evidence of tuberculous disease when the animals were killed would indicate that infection was of a temporary nature. It ought to be noted, however, that in the case of the cow the recovery was not complete six months after infection. Taking all the facts into account, the experiments indicated that the risk of cattle becoming affected naturally from consumptive human beings must be very slight. The sub-committee did not feel justified in drawing from the results of the experiments any conclusion as to the risk of infection in the opposite direction, viz., from cattle to man.

Sir Nigel Kingscote said the committee of selection presented the following unanimous recommendation:—"That His Royal Highness the Prince of Wales be respectfully approached with an expression of the unanimous desire and earnest hope of the Council of the Society that His Royal Highness will be graciously pleased to accept the office of President of the Society for the ensuing year." Lord Egerton of Tatton having cordially seconded the resolution, the President said he was sure the Council would be quite unanimous in adopting the resolution. They all knew the great interest which His Royal Highness took in every matter connected with agriculture, and with their shows, at which he had been a successful exhibitor. He felt it would not be possible to have for their meeting of the ensuing year a better President than the Prince of Wales. The resolution was then carried by acclamation.

Mr. Dugdale, from the Dairy Committee, reported that since the last meeting of the committee, the Board of Agriculture had issued a regulation under which, where the proportion of water in a sample of butter exceeds 16 per cent., it shall be presumed for the purposes of the Sale of Food and Drugs Acts, 1875 to 1899, until the contrary is proved, that the butter is not genuine by reason of the excessive amount of water therein. In view of the resolution which was passed by the Council at the instance of the Dairy Committee on March 5 last, the committee regarded with satisfaction the action of the Board of Agriculture in this matter.

In reply to the desire expressed by the Council His Royal Highness the Prince of Wales has been graciously pleased to accept the office of President for the ensuing year.

THE SOCIETY OF ARTS.

"ENGLAND AND THE PERSIAN GULF."

At a meeting of the Indian Section of the Society of Arts, held on the 8th ult., a paper on "The Past and Present Connection of England with the Persian Gulf," was read by Mr. T. J. BENNETT, of the *Times of India*. Sir E. A. SASSOON, M.P., presided.

Mr. Bennett, after dealing with the historical aspect of his subject, said that if our efforts to keep the Gulf free from slavery had fallen short of the success that we had hoped for, it had not been through lack of vigilance, either in the old days or in more recent times. Among other services which England had rendered in the Gulf was the systematic survey of its coasts, at one stage of which every officer engaged broke down—a fact which would surprise none who knew the climatic conditions under which naval service in the Gulf was performed. Another noteworthy respect in which England had contributed to the peace of the Gulf was in the help which her representatives had given to the Persian Government in repressing the illicit trade in firearms.

The importance of the success of England in bringing about the opening of the Karun river to foreign navigation had perhaps been at first somewhat exaggerated, but the construction of connecting roads was at length having the desired effect, and Consular reports showed that trade was increasing, and that certain products had now, by means of the new route, been for the first time brought down to the Gulf for exportation. And England stood on precisely the same footing in regard to the Karun as the rest of the world, for whereas, when France, in the later Seventies, was seeking for a concession for the irrigation of the plain through which the Karun runs, she stipulated for an exclusive right of navigation on the river, England asked for no exclusive right whatever. Our commercial monopoly in the Gulf, if such it might be called, had been acquired through no policy of selfish exclusiveness, but by what might fairly be called commonplace shop-keeping enterprise.

The virtual non-existence of Russian commercial interests in the Gulf was a fact to which strangely little attention had been paid by the advocates of what was vaguely called a concession to that Power. If the inference that should be drawn from that fact should be that Russia's object in seeking for railway communication with the Gulf was a political and strategic, and not a commercial one, then we had pressed on us in a peremptory fashion the Indian factor in the problem, a factor which had been more or less efficient at intervals during the greater part of three centuries.

The appearance of Russia in the Gulf, whether as owner in sovereign right of some port or island, or as lessee of some maritime terminus of a railway joined to her Transcaspian line, would involve a large and costly recasting of our naval resources in Indian waters. This was one reason why, in carrying out their policy, the British Government would do well to give the fullest weight to such promptings as might reach them from India. Another reason was, not that there happened to be at the head of the Indian Government at this moment a statesman fully primed with the knowledge of that question, but because normally the Indian Government was fully on the alert with regard to it, and had more expert knowledge within its reach concerning it than the authorities in this country were believed to possess.

Sir E. SASSOON, in opening the discussion, said that the security of the Persian Gulf was as essential to our peace and security in India as the peace and security of Ireland were to us here at home. Our best policy was to see that no change took place in the policy of the open door, that those few institutions which carried aloft in Persia the flag of England should be firmly supported, and that the Consular staff should be increased.

FUNCTIONS AT THE INSTITUTE.

EXHIBITION OF THE GIFTS AND ADDRESSES PRESENTED TO THE PRINCE AND PRINCESS OF WALES.

The Exhibition of the Gifts and Addresses presented to their Royal Highnesses the PRINCE and PRINCESS OF WALES during their recent colonial tour, was opened to the public on the 15th ult. On the day previous Her Majesty the QUEEN, the Prince and Princess of Wales, and Prince Edward of Wales, paid a private visit to the exhibition, and expressed themselves highly pleased with the arrangements. The collection has been placed in the North Gallery, where the wedding presents to the Prince and Princess, and the Jubilee addresses and presents to the late Queen Victoria, were exhibited. The arrangement follows, in geographical order, the course taken by the *Ophir*. The greater portion of the exhibition naturally consists of the loyal addresses from the various cities and towns visited by their Royal Highnesses. These form a unique collection, evincing the unanimous and heartfelt loyalty of the Colonies, and their patriotic devotion to the mother-country and the reigning family. Many of them are remarkable for the excellence of their design and calligraphy, as well as for the sentiments expressed.

The presents are also equally interesting, and, coming from so many different sources, are of a very varied character: some are remarkable for their value or beauty, others are striking curiosities. Among the Eastern gifts, the most noteworthy are a star-shaped box from the Federated Malay States, and a facsimile of the traditional chain of office of the Sultans of Perak, in pure gold. The Australian gifts are remarkably handsome and costly, and the New Zealand collection deserves special attention. It includes beautifully carved models of Maori houses, enriched with gold and silver, and inlaid with greenstone; numerous greenstone *meres*, many of them handed down from generation to generation for centuries; also feather mats and kilts, huia feathers, and a model of the sacred canoe. From South Africa come precious stones, and ingenious mementoes of the war. Boer prisoners are represented by articles made by them in South Africa and St. Helena, showing great mechanical ingenuity. Canada, like Tasmania, is represented by a beautiful collection of furs, and by some valuable jewellery, notably two unalloyed nuggets from the miners of Atlin, British Columbia, and a branch of maple leaves in gold, the outline and stem being marked with brilliants. Indian souvenirs, also, are numerous, including the canoe which was used by the Royal tourists at Ottawa.

In all there are 871 exhibits: a full descriptive catalogue of these has been compiled, copies of which can be obtained at the Institute. The exhibition will remain open during the summer months, on week-days, from 11 a.m. till 7 p.m. The admission is 1s.; the proceeds will be contributed to the "Coronation Gift" to King Edward's Hospital Fund.

COMMERCIAL INTELLIGENCE DEPARTMENT.

CORRESPONDENCE AND ENQUIRIES.

The following are given as specimens of some of the enquiries which have been addressed to, and satisfactorily answered by, the Institute during the past month (May).

* * All communications must be authenticated by the name and address of the writer. Enquiries which would involve special applications or expense will be a matter of arrangement with the correspondent.

- T. M., *Berks*.—Cultivation of Alfalfa or Lucerne.
- D. & Co., *London*.—Cultivation of pepper.
- H. C. R., *London*.—Yacal-wood.
- D. E. H., *Shipley*.—New Zealand ornamental timbers.
- R. & Co., *Wolverhampton*.—Weights and measures in Hayti and Cuba.
- F. S. W., *Folkestone*.—Sunflower cultivation.
- E. S., *Manchester*.—Aden.
- A. M. J., *Hull*.—New patent process for making sulphuric acid.
- J. J. F., *London*.—Climate of Sao Paulo and Santos.
- R. E. W., *Liverpool*.—Molybdenite in Australia.

REQUIREMENTS REGISTRY.

In order to provide correspondents with an opportunity of making known special "wants" or "needs" in the British Colonies, India, and Foreign Countries, space will be regularly devoted to the publication of approved notices in the IMPERIAL INSTITUTE JOURNAL. Notices, as a rule, should not exceed 25 words in length, for which a charge of 2s. 6d. will be made for each insertion. Special arrangements can be made for longer notices.

SPECIMENS OF FOREIGN AND COLONIAL WOODS desired. Purchase or exchange. Names and localities must be well authenticated. Address—HERBERT STONE, BRACEBRIDGE-STREET, BIRMINGHAM.

THE CURATOR OF THE CANADIAN SECTION OF THE IMPERIAL INSTITUTE is prepared to furnish information about Canadian Trade and to supply names of importers, manufacturers, shippers, etc.

The following trade enquiries have been received at the Canadian Section of the Imperial Institute, from the Curator of which Section further particulars may be obtained:—

Home Enquiries.—A Scotch firm wish to appoint responsible Canadian resident agents in the leading cities for the sale of Clyde refined sugars.

A London house seek the services of an influential Canadian agent to deal in French wines and champagnes.

A firm of manufacturing confectioners are prepared to appoint a Canadian agent who is in a position to advantageously introduce their specialities to the trade.

A London manufacturer's agent, long established, wishes to hear from Canadian manufacturers and shippers desiring representation.

Canadian Enquiries.—A commission merchant residing at St. John, New Brunswick, who possesses large warehouse accommodation, asks to be placed in communication with wholesale wine and spirit merchants, and also with manufacturers of builders' materials such as fire-clay goods, fire bricks, cement, etc.

A Canadian manufacturer of "Excelsior" for upholstering purposes wishes to hear from United Kingdom importers of the material.

A Toronto manufacturer's agent claiming a good connection in Eastern Canada, and able to furnish United Kingdom reference, is prepared to represent a few manufacturers and shippers.

SOUTHERN NIGERIA.

By the Southern Nigeria Order in Council, 1899, which came into operation on the 1st January, 1900, part of the territories of the Royal Niger Company, Chartered and Limited, was added to the Niger Coast Protectorate, and the combined territories were constituted into the Protectorate of Southern Nigeria, under the administration of a High Commissioner.

In the report by the High Commissioner on the Blue Book for 1900, it is stated that the statistical system which obtained in the Royal Niger Company differed from the system observed in the Niger Coast Protectorate Blue Book, and comparison is, therefore, impracticable between the figures in the Blue Book for 1900 and the statistics contained in the Blue Books of the Niger Coast Protectorate. The financial returns in the Blue Book of 1900 relate to the period ending on the 31st March, 1900, and consequently do not wholly represent the statistics either of Southern Nigeria or of the Niger Coast Protectorate. There was a decrease of £5,459 in the revenue of the year ending 31st March, 1900, as compared with the revenue of the previous year. The decrease is the more noteworthy because, during the last quarter of the year, duty was received in respect of the importations of the Niger Company. The amount of duty received at Akassa during the last quarter was £4,617, and probably a similar amount was collected at ports in the Western Division. But for this increase the decrease mentioned above would, therefore, have been nearly £15,000. It has to be further remembered that *ad valorem* duties were levied during the last quarter of the year for the first time. The decrease can, however, be accounted for by the large decrease in the importations of rum and gin, which was probably, in part, due to the large importation during 1898-99, as is shown by the following figures:—

	1899-1900.	1898-99.	1897-98.	1896-97.
	Gallons.	Gallons.	Gallons.	Gallons.
Gin . . .	614,298	980,944	857,802	598,073
Rum . . .	164,208	324,161	266,969	253,289

Of the increase, £29,389, which took place during the year in the expenditure, £11,710 was due to increases in personal emoluments and £17,678 to expenditure on other charges. It will be seen, therefore, that as regards the period ending the 31st March, 1900, the incorporation of territories of the Royal Niger Company produced relatively little change in the expenditure and revenue of the Protectorate.

By universally accepted custom, the currency of the Protectorate is, as between persons who are not natives of the Protectorate, the British currency. The natives, in dealings between themselves, use in different parts of the Protectorate brass rods, manillas, brass wire, gin, cloth and tobacco. In transactions between or with Europeans, these articles cannot be regarded in any way as serving the purpose of a currency, their use in such transactions being merely an instance of barter. In the Benin territories, as in Lagos, cowries are used for small purchases and may be regarded as acting as a currency to a limited extent. The absence of coin in the district has made it necessary to recognise that orders of the Native Courts can be complied with by payment in manillas, brass rods, etc., and even in "trade goods" except gin. This custom probably originated with the provisions contained in Section CXI. of the African Order in Council, 1880.

The estimated average value of brass rods is 2½d., of manillas 1½d., and of wires ½d. The value varies, however, not only in different districts, but also at different times of the year. The use of "wires" is confined to parts of the Old Calabar and Cross River districts. In other districts the absence of a small medium of exchange is remedied in native transactions by sub-dividing tobacco, gin, etc.

By the "Amended Customs Tariff Proclamation of 1900," silver of the realm (meaning of course the United Kingdom) not being of the established standard in weight or fineness is absolutely prohibited from importation. During 1900 specie was imported to the value of £135,309. The importations of specie into the Niger Coast Protectorate during the years 1897-98, 1898-99, 1899-1900, were £29,202, £29,290, and £36,372, respectively. Practically there was no exportation of specie during 1900.

With regard to trade and commerce, the exports and imports in 1900 nearly balanced one another, there being a surplus of £18,021 only of exports over imports. This surplus, however, is only arrived at by including in the imports the sum of £135,319, the amount of specie imported. As there was practically no export of specie, the figures in reality show that the value of the imports exceeded the value of the exports by over £100,000. The exports from the Protectorate to foreign countries was very largely in excess of the imports from those countries. This large excess is due to the large quantities of palm kernels shipped to Germany, and in a minor degree to the palm oil shipped to France.

In the case of the United Kingdom, the imports into the Protectorate were, unlike those from foreign countries, in excess of the exports from the Protectorate. This surplus of imports over exports is largely due to the fact that £130,850 specie was imported from the United Kingdom. Kerosene and lamp oil to the value of £6,047 were imported from the United States, and £1,665 of kerosene and lamp oils and £4,459 of specie reached the Protectorate from Grand Canary. With these exceptions the principal importations were confined to imports from the United Kingdom, Germany and Holland, and the principal exports to those sent to the United Kingdom, Germany and France. The importation of perfumery from Germany largely exceeds the importation from the United Kingdom. The importations of gin and geneva from Holland and Germany complete the list of cases in which the imports from the United Kingdom were exceeded by the imports from other countries.

No change in the direction of trade appears to have taken place. The import and export returns contained in the Blue Book for 1900 include the imports into and exports from Northern Nigeria. This fact accounts for the amount of gum copal exported and also for the large exports in ivory. But with these two exceptions there is nothing to show that the exports returns have been greatly increased by exports from Northern Nigeria.

THE WORLD'S SUGAR PRODUCTION AND CONSUMPTION, 1800-1900.

The above is the title of a monograph recently issued by the United States Treasury Bureau of Statistics. It discusses the sugar production and consumption of the world during the past century, and especially during the last half-century, in which the burden of sugar production has been transferred from cane to the sugar-beet, and in which the world has so largely increased its consumption of sugar. The world's sugar production has grown from 1,150,000 tons in 1840 to 8,800,000 tons in 1900. During the same period the world's population has grown, according to the best estimates, from 950,000,000 to about 1,500,000,000. Thus, sugar production has increased about 650 per cent. while population was increasing but about 50 per cent. Considering the United States alone, it is found that the consumption of sugar, which in 1850 was only 22 pounds *per capita*, was in 1901 over 68 pounds *per capita*.

One especially striking fact shown by the statistics presented in this study is the rapidly increasing proportion of the world's enlarged sugar consumption which is supplied by beets. According to the figures presented by this study, beets, which supplied in 1840 less than 5 per cent. of the world's sugar, in 1900 supplied 67 per cent. of the greatly increased

consumption; while cane, which then supplied 95 per cent. of the world's sugar consumption, now supplies but 33 per cent. Stated in quantities, it may be said that the world's cane-sugar supply has grown from 1,100,000 tons in 1840 to 2,850,000 tons in 1900, an increase of 160 per cent; while that of beets has grown from 50,000 tons in 1840 to 5,950,000 tons in 1900, an increase of 11,800 per cent.

The figures above quoted include that portion which enters into the world's statistical record of sugar production, and does not include the large quantities of cane sugar produced in India and China for home consumption, and in a considerable number of the tropical countries does not include that portion of the sugar consumed at home. Even if these figures of cane-sugar production for home consumption were obtainable, the production from beets would still show a more rapid growth, during the last half-century, than that from cane. This is, apparently, due to two great causes:—(1) the elimination of slavery in the tropics, the seat of the principal sugar production; and (2) the intelligent study of, and Government aid to, the production of beet sugar in the temperate zone, especially in European countries.

One effect of this enormous increase and the competition which has accompanied the developments above alluded to has been a great reduction in prices to the consumer. The figures of the Bureau of Statistics, obtained from statements supplied by importers of the cost in foreign countries of the sugar which they import, show that the average cost of the sugar which they imported into the United States in 1871-2 was 5·37 cents per pound, and in the year 1899-1900, 2·49 cents per pound.

The sugar production of France has grown from 23,000 metric tons in the sugar year 1839-40 to 805,000 tons in 1899-1900; that of Germany, from 12,659 metric tons in 1839-40 to 1,875,000 tons in 1900-01; Austria Hungary, from 25,000 metric tons in 1853-54, the earliest possible date from which figures are obtainable, to 1,120,000 tons in 1899-1900; Russia, from 19,000 metric tons in 1853-54 to 900,000 tons in 1899-1900; Belgium, from 12,000 metric tons in that year to 300,000 tons in 1899-1900; Holland, from 1,000 metric tons in 1860-61 to 180,000 in 1899-1900. Turning to the cane-sugar-producing areas, in which the statistics are not available for so long a period, it is found that the exports from the Philippine Islands increased from 23,416 metric tons in 1849 to 233,000 metric tons in 1896. From Cuba the exports in 1860 were 537,491 tons, and in 1894 968,750; in Hawaii the production has grown from 11,200 tons in 1875 to 243,470 tons in 1899. Java produced in 1884 338,856 tons, and in 1901, 765,000 tons; and Brazil, which in 1884 produced 68,335 tons, produced in 1901, 215,000 tons.

The table which follows shows the world's production of sugar from cane and beets, respectively, at decennial years from 1840 to 1900, and the percentage supplied by beets:—

Year.	Cane Sugar. Tons.	Beet Sugar. Tons.	Supplied by Beet. Per Cent.
1840	1,100,000	50,000	4·35
1850	1,200,000	200,000	14·29
1860	1,510,000	389,000	20·43
1870	1,585,000	831,000	34·40
1880	1,852,000	1,402,000	43·08
1890	2,069,000	3,633,000	63·70
1900	2,850,000	5,950,000	67·71

MINERAL RESOURCES OF YUNNAN.

It has long been known that the Chinese Empire contained numerous deposits of coal, but only very recently has Yunnan been counted among the districts provided with coal resources. The district comprised approximately between the Red River of the south, the meridian of Haiphong on the east, and the Blue River, is destined to become one of the most interesting mineral countries of the globe. It has an almost uniform geological conformation, and most of the beds have been worked by the Chinese. Its chief mineral wealth, besides coal, consists of copper and tin. Extensive deposits of mercury have also been found. The mines of Hong-Hai contain coal beds of very remarkable thickness regularity, and the product is relatively pure so far as ashes are concerned; but, unfortunately, this fuel is very brittle, takes a long time to light, and crackles under fire; it gives an excessive proportion of fine coal, which can only be changed into briquettes by mixing it with Japanese coal. The copper mines of Yunnan have been worked for more than a thousand years. In the mining regions the forests have entirely disappeared, wood charcoal being the only fuel employed for the needs of ancient metallurgy. According to the *Bulletin de Geographie Commerciale*, the production in the 12th century reached 6,000 tons of copper; the output is now limited to about 1,500 tons, on account of the scarcity of fuel. The ore from the accessible parts of the beds is exhausted by the Chinese miners. The deep veins remain, and can only be worked by modern methods. These are so exceptional on account of their extent, that the country may become one of the most important centres for the manufacture of copper. The tin mines of the region of Mong-Tze, are actively worked by a mining population of about 30,000 people. These beds are of a peculiar character, with accumulations of red clay, filled with grains of oxide of tin, which the Chinese with their cheap manual labour, easily separate by washing. The tin, manufactured by wood charcoal, is much less pure than that of Malaysia. The total production is some 1,500 tons. About 1,000 tons are sent to Hong Kong to be refined. All the beds have been known for a long time, and remain legally at the disposition of the mining population. A new legal organisation is necessary in order to render the mines of China accessible to mining industry, without infringing on the rights of the people. The present management of the mines is based on the system of privileges and of monopoly, which is the foundation of all Mandarin administration.

THE GAMBIA.

Statistical returns recently received from the Gambia, from which the following figures are taken, show that the trade of the colony for the year 1901 was considerably less in value than that of the previous year. The total imports during 1901 were valued at £252,647, as compared with £277,659 in 1900. The value of the exports during 1901 was £233,667, while in 1900 they were valued at £281,976. Of the total value of the imports in 1901, the United Kingdom contributed £116,920, the British possessions £25,532, while the remainder, £110,194, is derived from other countries. The exports to the United Kingdom amounted to only £26,058, and to British possessions £2,237, while to other countries, chiefly France, they amounted to £233,667. The quantity of ground-nuts exported during 1901 was estimated at 25,750 tons, valued at £172,405; in 1900 the quantity was 35,805 tons, valued at £221,841. Of shipping the total tonnage in 1901 was 285,071 tons, of which 220,098 tons were British, while in 1900 the total was 261,269 tons, of which 198,099 tons were British. In the Government Savings Bank the balance due to depositors on 31st December, 1901, was £5,019.

NEW BOOKS, etc.

HENRY SELL. (167, Fleet Street, London, E.C.) *Sell's Dictionary of the World's Press, and Advertisers' Reference Book, 1902.* By HENRY SELL. 22nd Year. La. 8vo., pp. 984. (Price, 7s. 6d.) As a complete record of the World's Press this bulky volume occupies a unique position, both on account of its comprehensiveness and completeness, as well as for the careful classification shown in its pages. Each year witnesses a great expansion in the number and quantity of newspapers and periodicals published, so that this book has become absolutely necessary to all connected with the newspaper press. Exhaustive lists of all the daily and other papers issued in the United Kingdom are given in alphabetical order, showing the value and diversity of the organs of opinion and channels of printed information on current affairs throughout the country. The past year has produced some considerable developments, especially as regards cheapness. Large news sheets containing the latest information, with original articles and up-to-date illustrations, are now circulated in the Metropolis and conveyed by rail in time for early distribution hundreds of miles away at the small cost of 3d. to the buyer. The series of special articles which occupies the first portion of the book, and forms its distinctive feature, will be read with much interest. Sir E. Russell writes on "the Outlook for Liberal Journalism" from a Liberal point of view, while Mr. H. J. Palmer discusses the same subject from the Conservative side. In "A glance at the Comic Papers of the Victoria Era," by J. Farlow Wilson (illustrated), the great improvement made in the art of comic illustration during this period is graphically shown; other literary topics are also ably dealt with in the succeeding chapters, and the "Story of fast printing" by Mr. John Southward, is specially worthy of notice. The numerous excellent portraits and illustrations make this portion of the work unusually attractive, and the printing and illuminated cover are deserving of much commendation. As a work of reference this Dictionary can be well recommended to all interested in newspapers and newspaper work. From the preface we learn that the total number of papers published in the British Isles is 2,532. London sends out 554 of these; there are 1,562 magazines and 209 quarterlies issued.

MACMILLAN & CO. LTD. (London, 1901.) *The Sherbro and its Hinterland.* By T. J. ALLDRIDGE, F.R.G.S., District Commissioner, Sherbro, West Coast of Africa. La. 8vo., pp. 350. With two Maps. (Price, 15s.) The author of this interesting book was connected in an official capacity with the district of Sherbro, a portion of the colony of Sierra Leone, and its Hinterland, for thirty years, and during that time had many opportunities of becoming intimately acquainted with the manners and customs of the people and their ways of living. He appears to have won the goodwill and gained the confidence of the natives by judicious treatment, and his observations are, therefore, extremely valuable. Practically nothing was known of the Hinterland before Mr. Aldridge visited it, and he appears to have been the first white man who travelled through this region. His book gives an account of the indigenous products of the country, such as the oil palm, from which palm wine is made, the bamboo palm, camwood tree, cotton tree, rubber, banana, pine-apple, cocoa-nut, and mangoes. The cultivated crops are rice (the staple food), cassava, and cotton. The native industries consist in the manufacture of cotton cloths and pottery. The secret societies, so numerous among these superstitious tribes, are well described, and also the various journeys made by Mr. Aldridge in the interior, during which he travelled over 6,000 miles, and concluded many treaties with the native chiefs which led to the establishment of the Protectorate. The suppression of the Mendi rising in 1898, which was caused by the slave trade being stopped, has been followed by a great improvement in the condition of the country, which is now awaiting commercial development. Mr. Aldridge gives much praise to the usefulness of the missions in these regions, but urges that the people should be first approached through their daily avocations. The numerous excellent illustrations inserted in the volume are from photographs taken by the author, and add greatly to its interest. The book will be found most valuable to those desiring acquaintance with Sherbro and its Hinterland, or who may propose to travel through this country.

THE CLARENDON PRESS, OXFORD (1902). (London, Henry Frowde.) *British Rule and Jurisdiction beyond the Seas.* By the late SIR HENRY JENKYN, K.C.B. With a preface by Sir Courtenay Ilbert, K.C.S.I. 8vo., pp. xxiv + 300. (Price, 15s. net.) The completion of this valuable work was arrested by the author's untimely death, in December, 1899; its revision for the press was undertaken by Sir C. Ilbert, who, in his preface, has given a short biographical sketch of Sir Henry Jenkyns, for many years Parliamentary Counsel to the Treasury. In his official capacity Sir H. Jenkyns drafted, or helped to draft, many important legislative measures, and was well acquainted with the nature of English legislative machinery and the actual working of the British Constitution. This book contains a complete exposition of the constitutions and Government of the British possessions beyond the Sea, and the exercise of British jurisdiction in the Colonies, Dependencies and Protectorates, and in foreign countries. It will, no doubt, be referred to as the most reliable authority on the subject. The Act which established the Australian Commonwealth became law whilst the work was under revision, and it was deemed advisable to rewrite the chapter on the Self-Governing Colonies; this was done by Mr. J. A. Simon. A useful Index is appended to the volume.

ABEL HEYWOOD AND SON. (Manchester, 1901.) *The Harmony of the Empire; being a series of sketches in Pictorial Geography of the British Possessions and Spheres of Influence.* By the Author of *The Making of Europe*, and *The Making of the British Colonies* (Nemo.). 8vo., pp. xiii + 309. This book is designed to give an historical and descriptive account of the numerous minor possessions and outlying dependencies of the British Empire, many of which are very little known, and some there are whose names even are but seldom mentioned. These form connecting links in the various trade routes, and their value and importance increase with the development of trade and commerce on which the prosperity of the Empire so largely depends. The introductory portion of the volume gives an explanation of Mercator's projection of the world, and treats of sea power, trade routes, steam as a motor power, coaling stations, etc. In each of the six sections of the book, a group of the extra-colonial dependencies of Great Britain is dealt with; the last section relates to Egypt, which is given more fully on account of the importance of the subject. The author has endeavoured to make his pages as attractive as possible, and the book will be found most interesting to young readers, whose ideas of the various portions of the Empire will be greatly widened and enlarged by studying it. The dates and notes given in the margin will be found useful for this purpose.

B. T. BATSFORD. (London, 1902.) *Antique Works of Art from Benin.* Collected by Lieutenant-General Pitt Rivers, D.C.L., F.R.S., F.S.A., Inspector of Ancient Monuments in Great Britain, etc. 4to., pp. 100. Illustrated. (Price, 12s. 6d. net.) This beautifully illustrated work contains representations of a large collection of antiquities brought from Benin after the annexation of the country to the British Crown in 1897, and now in the Pitt-Rivers Museum at Farnham, Dorset. After the capture of the city of Benin in 1897 by the punitive expedition, many hundreds of art relics in bronze, wood and ivory were discovered in the King's compound and the Juju houses; many of these antiques are now in the British Museum, but the late General Pitt-Rivers collected a large number of them, and photographic illustrations of these, printed on art paper, are given in this volume. The people of Benin were great makers of ornamental brass work during the 17th century; they appear to have learned the art from the Portuguese, but much of their work bears the stamp of an Arabic origin. The volume is well printed and the illustrations are produced in the best artistic style. The work will be found most interesting by archaeologists and art connoisseurs.

JOHN SANDS. (Sydney, 1902.) *Sands' Sydney, Suburban and Country Commercial Directory for 1902.* Forty-second year of publication. La. 8vo., pp. xli + 730. (Price, 22s. 6d.) This valuable Directory is well known throughout the Australasian Colonies as well as in the United Kingdom, and has become indispensable to business men and travellers. The same arrangement of contents adopted in previous issues has been carried out in the present edition; a Country Commercial Directory, alphabetically arranged in Town order and printed in larger type, has been introduced this year. The information given has been brought up to date, and the work has been compiled with the same amount of care and attention as formerly. For quantity and conciseness of matter it will

compare favourably with the best of our home productions, and the editor has every reason to be satisfied with his work, which is as complete and reliable as it is possible to render so voluminous a publication.

W. & R. CHAMBERS, LTD. (London and Edinburgh, 1902.) (The Linscott Publishing Co., Toronto and Philadelphia.) *Progress of South Africa in the Century*. By GEORGE McCALL THEAL, D.Litt., LL.D., Historiographer to the Cape Government (*The Nineteenth Century Series*), 8vo., pp. xxx + 524 (Price, 5s. net). This is the second volume of the *Nineteenth Century Series*, which is designed to illustrate the progress of English-speaking States and Colonies during the past century, in all departments and from every point of view. The author is the well-known historiographer to the Cape Government, who possesses an intimate and personal acquaintance with South Africa and its inhabitants. The materials from which the book has been written are chiefly the official archives, and Mr. Theal has also consulted many hundreds of printed volumes on South Africa. The book contains a plain unvarnished statement of facts, free from all partisan spirit, and it is written in language which cannot be misconstrued, an important requisite in writing this account. The volume is a valuable addition to the many books Mr. Theal has produced, which no doubt will become the standard works of reference on South African history. Mr. Theal leaves the subject of the present war to be dealt with by another pen and concludes by hoping that the time of passion and bloodshed may speedily pass away, "and that the restoration of peace and concord in South Africa may be followed by the still closer political union of the States widely severed by land and sea that have shown themselves at heart to be one."

J. GRIFFIN & CO. (Portsmouth, 1902.) *The Naval Annual, 1902*. Edited by T. A. BRASSEY. Sixteenth year of publication. La. 8vo., pp. vi. + 453. (Price, 15s. net.) This useful annual is a record and review of the progress of the British Navy during the past year, showing the great increase in shipbuilding and improvements in construction that have taken place. Lord Brassey writes respecting the *personnel* of the Navy, and urges the importance of having Naval Reserves. Mr. J. K. Thursfield gives an account of the British Naval Manœuvres of 1901, while the Foreign Naval Manœuvres are described by Mr. John Newland, who also discusses the question of "The Invasion of England," concluding that "a sufficient and efficient Navy" is the essential factor in national as in Imperial defence. The chapter on submarines is mainly limited to a description of the boats already in existence, as they have not as yet got much beyond the experimental stage. Mr. G. R. Dunell contributes the article on "Marine Engineering," in which the steam turbine and the water-tube boiler are dealt with. Part II of the volume consists, as usual, of the lists of British and Foreign ships, and of diagrams which have been largely increased in number, and enhance the value of the book. The articles on Armour and Ordnance will be found interesting and suggestive, and the carefully compiled Ordnance Tables and Statistics in the last portion of the volume will be most useful for reference and comparison. As an authority on naval questions the work has gained a well-deserved reputation. Among the illustrations a photographic picture of a British Submarine presents a graphic idea of this new species of sea-monster.

A new map of the Witwatersrand Goldfields, with inset plans of the Heidelberg, Klerksdorp and Nigel Districts, has been published by the *Financial Times* (72, Coleman Street, E.C.). In view of the re-opening of the mines which is now rapidly taking place, this map will be found most useful. It is the latest and most up-to-date map of the Rand, and is coloured to show the controlling interests; an index to the Witwatersrand Properties is given.

CITY BRANCH OF THE IMPERIAL INSTITUTE, AT 49, EASTCHEAP, LONDON, E.C.

The CITY BRANCH OF THE IMPERIAL INSTITUTE embraces:—

A SAMPLE ROOM for the display of raw and manufactured products from the Colonies and India, for which it is desired to find openings in markets at home and abroad.

An INFORMATION OFFICE where enquiries relating to industrial, commercial and other matters connected with the Colonies, India and Foreign Countries are received and promptly dealt with.

A NEWS ROOM supplied with:—

- Hand-books and directories of the British Empire, including many pamphlets (for free distribution) dealing with Canada, the Australian States, New Zealand and South Africa.
- The chief trade papers of Great Britain, the Colonies and India.
- Many commercial periodicals of the United States, Germany, France, Austria, etc.
- Market reports, prices-current, official reports and statistics.

The City Branch is in constant communication, by telephone and messengers, with the Imperial Institute, South Kensington. Curators and other members of the Imperial Institute staff will attend at the office at stated times and by special appointment, to deal with enquiries and to assist in establishing or facilitating business relations with mercantile houses, etc., in the Colonies and in India.

- The Sample Room is open free to the public, by introduction.
- The News Room is free to Fellows of the Institute, as is also the Enquiry Office for the supply of such information as does not involve special research or correspondence.
- A subscription of the sum of one pound per annum, payable in advance, secures the free use of the News Room, and the supply, free of charge, of information not involving special research or correspondence.
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 - First enquiry, not involving special research or correspondence, free.
 - For each subsequent enquiry, not involving special research or correspondence, one shilling.
 - For each enquiry, involving special correspondence, or reference to home-experts, etc., five shillings.
 - For each enquiry involving Colonial or Foreign correspondence, ten shillings, or by special arrangement, if likely to be voluminous.

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8. The Institute will undertake the supply, at cost price, of translations, into any language, of trade circulars, prices-current, etc., the conversion of weights, measures, coinages, etc.

SCHOOL OF MODERN ORIENTAL STUDIES.

Founded by the Imperial Institute in union with University College and King's College, London.

In 1887 it was suggested that a school of Modern Oriental Studies should be organized as a branch of the Institute, in imitation of the very efficient establishments of this kind which are carried on, with Government resources, in France, Germany, and Austria. The promulgation of this proposal led to negotiations with the authorities of University College and King's College, London, which resulted in their co-operation with the Institute in the establishment of the School. A Special Committee having been appointed to decide upon a system of work, it was arranged that classes for instruction in the Oriental languages required by students qualifying for examinations for the Indian Civil Service, should be held at University College, while modern Oriental languages, other than the Indian languages, should be taught at King's College, and that the Imperial Institute should undertake the general administrative and financial work. The School was officially opened in January, 1890, when an inaugural address was delivered by Professor Max Müller at the Royal Institution, in the presence of His Royal Highness the Prince of Wales. The daughters of the late Colonel W. J. Ouseley (Bengal Army) have established and endowed, in his memory, three scholarships, in Arabic, Persian, Hindustani, and other Oriental languages, in connection with the School, each one of the value of not less than £50 per annum. The following Scholarships have already been awarded:—

YEAR.	SUBJECT.	EXAMINERS.	AWARDED TO.
1892	Arabic .	{ Dr. WELLS Prof. SALMONÉ	No Competitors.
1893	Arabic .	Dr. WELLS	Mr. HENRY LEITNER, junr.
"	Persian .	{ Mr. JOHN T. PLATTS MIRZA HUSSEIN KULI KHAN	Mr. E. DENISON ROSS.
1894	Hindustani .	Mr. JOHN T. PLATTS	No Competitors.
"	Persian .	Dr. ROBERT BRUCE	Mr. DIWÂN TEK CHAND.
"	Chinese .	Sir THOMAS WADE	No Competitors.
1895	Turkish .	Dr. WELLS	Mr. L. STENNETT AMERY.
"	Hindustani .	Mr. J. T. PLATTS	Mr. ASGHAR ALI.
"	Chinese	No Competitors.
1896	Burmese .	Gen. R. D. ARDAGH	Mr. LEE AH YAIN.
"	Arabic .	Dr. WELLS	Mr. H. G. SARWAR.
"	Marathi .	Mr. J. W. NEILL	Mr. V. R. PANDIT.
1897	Gujarati .	Dr. S. A. KAPADIA	Mr. RUSTUM D. N. WADIA.
"	Persian .	Mr. J. T. PLATTS	Mr. P. S. PATUCK.
"	Chinese .	Mr. W. A. PICKERING, C.M.G.	No award.
1898	Bengali .	Prof. J. F. BLUMHARDT	Mr. B. C. GHOSH.
"	Turkish .	Dr. WELLS	Lieut. A. M. SETON, R.A.
"	Chinese	No Competitors.
1899	Arabic .	Dr. WELLS	Mr. G. A. KHAN.
"	Persian .	Dr. ROSS	Mr. R. M. DAVIS.
"	Sanskrit .	Prof. C. BENDALL	Mr. S. K. GHOSE.
1900	Hindustani .	Mr. J. T. PLATTS	Mr. N. HAGOPIAN.
1901	Marathi .	Prof. J. W. NEILL	Mr. J. R. MARTIN.

An OUSELEY SCHOLARSHIP of £50, tenable for two years, will be awarded this year, should sufficient merit be shown, for proficiency in PERSIAN. No person will be admitted to competition for a Scholarship in a language which is his own mother tongue, nor for a Scholarship in a language allied to his mother tongue.

The examination takes place early in July, 1902.

Competitors must give notice on or before July 1, 1902.

The ages of Candidates are to be above 17 and under 25 years on January 1 of the year of examination.

Further particulars may be obtained from the Secretary, S.M.O.S., Imperial Institute, S.W.

GENERAL INFORMATION FOR INTENDING STUDENTS AT THE SCHOOL.

The classes which the "School of Modern Oriental Studies" comprises, are divided under two heads.

DIVISION I. includes classes for all Oriental Languages especially required by Students qualifying for examinations for the Indian Civil Service, the instruction being of the same character as that provided for some time past at University College and at King's College. This Division includes instruction in Sanskrit, Bengali, Hindi, Hindustani, Tamil, Telugu, Punjabi, Pali, Marathi, Gujarati, Arabic, and Persian.

DIVISION II consists mainly of classes for Modern Oriental Languages other than the Indian Languages.

The courses of tuition are of a practical rather than of an academic character; they have particular reference to commercial and official requirements and to the facilitation of colloquial intercourse with natives of Oriental Countries.

It is in contemplation, so soon as the number of students warrants the expenditure, to secure the services of native readers and teachers of conversation in connection with the classes of this Division.

The classes under this Division are conducted at King's College, where arrangements will also be made for the establishment of evening classes.

The Languages taught in Division II. comprise Colloquial Arabic, Armenian, Modern Greek, Colloquial Persian, Russian, Turkish, Chinese, Burmese, Japanese, Malay, and Swahili.

Arrangements have been completed by the Managing Committee and approved of by the Governing Bodies of the Imperial Institute and of the two Colleges, for the pursuit of studies relating to the history, literature, commercial and physical geography, political economy, and the natural and industrial resources, of the countries and districts in which the various languages are used.

Special Lectures or courses of Lectures will be delivered from time to time, in connection with the School, by experts or specialists, in any of the foregoing subjects.

There are three terms, of about ten weeks, in each year, as follows:—

SPRING TERM—commencing about the middle of January.

SUMMER TERM—commencing early in May.

AUTUMN TERM—commencing about the middle of October.

A fee of THREE GUINEAS per term will have to be paid, in advance, by each Student for each Language taken up for instruction. This payment will entitle the Student to the use, within the College, of text books, dictionaries, and works of reference required in connection with the particular Language taught, and to the use of all the facilities which it is proposed to secure in the development of the School.

Accommodation is provided at the Imperial Institute to enable Students to pursue their studies at hours when the classes are not held. The Libraries of both Colleges will be open to Students in any of the classes of the School, during the usual hours of study.

Intending Students should communicate with the Secretary at the offices of the Imperial Institute, London, S.W., where the registration of Students will take place, and where all information regarding the School will be supplied.

MONTHLY COMMERCIAL AND INDUSTRIAL SUMMARIES.

GENERAL COMMERCE AND INDUSTRY. COLONIES.

British North Borneo.—TELEGRAPHIC COMMUNICATION.—The directors of the British North Borneo Company have received a telegram from Governor Birch, stating that the extension of the telegraph line to Kudat has been completed. Direct telegraphic communication between that station and London is thus established.

Jamaica.—The *Mercantile Intelligencer* reports that trade has been quiet except in banana districts, where brighter prospects prevail owing to the good prices now obtained for this fruit. The news that a grant-in-aid will be made by the British Government to the West Indian colonies has been received with much satisfaction, though the sum—£250,000—mentioned appears small. The manner in which this grant-in-aid is to be applied is a matter of much consequence, and the final decision is awaited with keen interest. If the amount is divided in Jamaica on the sugar manufactured, it is considered as likely to be of no avail if the sugar is shipped to the United States of America—now the chief market—whereas, if a bounty is given on the sugar exported, the bounty will in the first place be a larger one, by virtue of the fact that Jamaica consumes about one-fourth of the sugar manufactured in the islands, and shippers will still be able to ship their sugar to whichever market they think best. In the case of shipments to America, this bonus would, however, be counterbalanced. The delay in sending news as to how the "grant-in-aid" is to be applied is occasioned, it is believed in the island, by the British Government trying to negotiate with America not to take the grant into consideration in levying duties on British West Indian sugars.

New South Wales.—MINING INDUSTRY.—According to the preliminary figures issued by the Under Secretary for Mines, the value of the total production of minerals for 1901 was £6,006,636, a net decrease of £564,184 on that of the previous year. The total number of men employed in and about the Mines of the State during the year under review is computed as 36,615, and shows a decrease of 7,130 persons on the year 1900.

GOLD.

The gold yield for the year 1901 was 267,061 oz., equal to 216,888 oz. fine, valued at £921,282, as compared with 345,650 oz. (280,214 oz. fine), valued at £1,194,521 for the year 1900—a decrease of 78,589 oz. and £273,239 in value.

SILVER, LEAD, ZINC.

The declared net value of silver, lead and zinc exported during the past year was as follows:—Silver, silver lead and ores, £1,854,463; lead (pig, etc.) £100,501; zinc (concentrates), £4,057; a total value of £1,959,021, showing a decrease of £828,429 on the value of the output for the year 1900. The bulk of the output is contributed by the Broken Hill mines, and the fall in prices in silver and lead practically crippled the industry, and caused the closing down of all but three of the principal mines. The drop in values also affected operations at other places where silver-mining is followed.

COPPER.

The value of the copper produced in 1901 was £413,302, showing a decrease of £14,734, for which the fall in the market value of this metal is likewise responsible.

TIN.

The production of tin during 1901 is valued at £77,315, which is a decrease of £43,617 on the previous year. Most of the tin is obtained from alluvial deposits, and the severe drought has greatly interfered with washing.

COAL, COKE AND OIL-SHALE.

The most gratifying feature in connection with mining during the past year was the sustained activity in the coal trade. The quantity of coal raised during the year was 3,968,426 tons, valued at £2,178,929, being an increase of 460,929 tons, and £510,018 in value over the previous year, and is the largest output recorded. The number of persons employed in the northern district during the year was 9,157, in the southern and south-western districts 2,499, and in the western district 535, a total of 12,191. The value of the coke manufactured during the year was £105,665. This shows a decrease of £3,955 as compared with the previous year, for owing to the fall in the price of metals, the demand for this commodity was smaller than in the previous year, and consequently some of the coke ovens were forced to close down. The value of the coke manufactured to the end of 1901 is estimated at £586,391. The value of the kerosene shale raised during 1901 was £41,498, showing an increase of £20,838 on that of the previous year, which is due chiefly to the activity of the export trade.

IRON.

Considerable attention is still being directed towards the question of establishing ironworks in this State capable of supplying the requirements of Australia. Two important schemes are being advocated, one to smelt ore at Lithgow from deposits in the western district, and the other to bring ore over the sea from the Blyth River, Tasmania, and smelt it in the vicinity of Sydney or elsewhere upon the seaboard. The indications all point to the fact that extensive iron smelting works will, at no distant date, be established in this State and employment found for a great number of hands. The value of ironstone raised for flux during 1901 was £3,765.

OTHER MINERALS.

In addition to the minerals already mentioned, the value of others raised during the year is as follows:—Diamonds £9,756; opals £120,000; alunite £9,438; antimony £1,138; bismuth £6,665; chrome £7,774; cobalt £1,051; limestone (for flux and lime-making), £22,041; platinum £779; sundry minerals, etc., £125,151; bringing the total for all minerals for the year up to £6,006,636.

South African Trade.—A committee has been formed to enquire into and report on the state of, and openings for, trade in Cape Colony, Natal, Orange River Colony, and the Transvaal, and to despatch to those colonies a deputation of experts to report on the same. The committee includes the following names:—Colonel R. E. Crompton, Mr. John Lockie, J.P., Mr. John Thomson, Mr. Charles Wills, Mr. Ben H. Morgan (editor, *Engineering Times*), and others. The three experts will leave for South Africa about the end of the present month: one, Mr. Ben H. Morgan, has been nominated to represent engineering interests; a representative of the Manchester Chamber of Commerce for textiles and soft goods, and Mr. T. N. Jenkin to represent miscellaneous trades. Facilities for travelling through the military lines throughout South Africa will be granted by the Colonial Office, and on the return of the deputation the information collected will be published. Mr. John Lockie has guaranteed the whole of the expenses

which the deputation will incur in order to expedite their departure to South Africa. Those interested in South African trade can address their enquiries to the offices of the National Industrial Association, 124, Palace-chambers, Westminster, S.W.

Victorian Tobacco.—The Minister of Agriculture has determined that Mr. Temple Smith, the Victorian tobacco expert, shall visit Queensland at the end of the present month. He says the objects of Mr. Smith's mission will be to ascertain the quality and constituency of the soils on which the best tobacco leaf is grown in that State, and the methods of curing, grading, and packing the leaf. Mr. Smith will also obtain the latest figures in regard to the quantity of tobacco grown, and the demand for the same. He will then enquire into the diseases, if any, that attack the plants in Queensland, and ascertain the results of using commercial fertilisers, and whether Europeans are taking up the work of growing tobacco. The prices at which it will pay growers to produce tobacco will furnish another subject for Mr. Smith's investigation.

INDIA.

Export Trade in Cottons.—The report of the Bombay Millowners' Association, presented at the recent annual meeting, furnishes much interesting information on the trade in cotton yarns and goods of Indian production. A serious endeavour was made during the past year by the Association to promote a trade in cotton piece-goods of Bombay production in markets where they appear to be less known than they ought to be. Bombay millowners fairly well understand the extent and nature of the demand in the Further East, but they are less definitely informed as to the possibilities in the considerable markets of the Asiatic provinces of Turkey. As regards East Africa also, though the major part of the trade of the ports for that region is done with India, the United States have obtained a virtual monopoly in regard to certain descriptions. The Association, therefore, some time ago, addressed several enquiries on these matters to the consular officers at Constantinople, Smyrna, Beyrout, Alexandria, Zeila, Mombasa, Pemba, Zanzibar, Dar-es-Salaam, Chinde, Beira, and Madagascar. Application was made for samples of particular articles sold in the markets mentioned which Bombay might be able to supply in competition with the existing sources of supply. The enquiry, however, was not limited to possible openings for an increased trade in Indian piece-goods; it was felt, if new or larger markets were to be secured on favourable conditions for such goods, a substantial total volume of trade must be established by creating a demand for various other articles of Indian production, and also a return trade in the produce of the regions thus opened to Indian exports. In other words it was felt that a large trade in a single commodity supplied from India was practically impossible. Confidence is expressed, as a result of the enquiries, that trade between India and East Africa will develop naturally, but as regards Syria and Asia Minor the results proved less encouraging. It seems to be admitted that Egypt must necessarily be the entrepôt for Bombay goods destined for Turkey and Levant. As regards East Africa, the Bombay millowners appear to have chiefly taken into consideration the possibility of more effective competition with American cotton piece-goods in the markets there. There appears to be some uncertainty, as to whether a quality of woven cotton goods which would compete effectively with the so-called "Americani" can be produced in Bombay mills from the short Indian staple. The business in grey shirtings and sheetings along the East African coast is described as enormous, and hence Bombay is the more anxious to enlarge her share of trade. Some hope is based on the fact that the American cotton goods have been used as practically the sole currency of the region in question, and as the rupee is now, apparently, being gradually introduced into Uganda and elsewhere, the disappearance of the prestige of American goods may not unreasonably be expected, and the substitution of the rupee currency in itself may assist the introduction of Indian cotton goods. Enquiries into the question of the alleged displacement of the British and Indian goods in the Aden markets have indicated that the rate of progression in American goods is not increasing, but they leave no doubt that the progression is maintained.

Indian Mining Association.—COAL TRADE COMPETITION.—At the annual meeting of the Indian Mining Association it was pointed out that the recent invasion of the Bombay and Colombo markets by English coal was due to abnormal causes, one of which was phenomenally low freights. On the other hand, Bengal coal had been handicapped by the inelastic transport charges obtaining on the railways serving the collieries. It was proposed that a special commissioner should be sent to Egypt to investigate and report upon the coal market there; at the same time enquiries should be prosecuted in the Far East, and a vigorous effort be made to repel the invasion of Japanese coal, and to replace it by Indian coal as far as Singapore.

Sugar Industry.—A large sugar plant at Ohur, in Behar, was recently started by the India Development Company. It has been erected in five months, and is regarded as a record of engineering achievement. The triple crushing mills will deal with 30 to 35 tons of cane an hour, the centrifugals are worked by water motors, and the other machinery is of the most modern type. Additional plant for erection in other centres has been ordered. The prospects of the industry are regarded as most hopeful.

FOREIGN COUNTRIES.

French Trade.—The monthly circular of the British Chamber of Commerce in Paris gives a general *résumé* of the import and export trade of France. The imports for the first three months of 1902 were, in value:—Alimentary produce, 172,902,000 francs; raw materials, 926,665,000 francs; manufactured articles, 191,333,000 francs; being a decrease in alimentary produce and raw materials of 9,327,000 francs and 5,593,000 francs respectively, and an increase of 88,054,000 francs in raw materials. The exports were, in value, as follows:—Alimentary produce, 169,314,000 francs; raw materials, 299,885,000 francs; manufactured articles, 519,147,000 francs; postal parcels, 58,401,000 francs; an increase in raw materials, 65,883,000 francs, and in manufactured articles, 66,025,000 francs, and a decrease in alimentary produce, 2,198,000 francs, and in postal parcels, 3,384,000 francs. With respect to interchange with the United Kingdom, imports from the United Kingdom of coal, cotton yarns, silk goods, cast iron, iron and steel showed decreases, and wool and woollens, machinery, chemical products, and cotton goods showed increases; whilst exports to the United Kingdom of wines, sugar and brandies, showed decreases, and woollen goods, silk goods, wool, yarns, and cotton goods showed increases.

The April trade returns are of a mixed character. The imports of raw materials are 136,000,000 francs, against 160,000,000 in 1901, and the imports 77,000,000 francs, against 73,000,000 francs; while the imports of manufactured goods are 65,000,000 francs, against 59,000,000 francs, and the exports 192,000,000 francs, against 210,000,000 francs. The revenue returns for the first three months of the year have also been issued. They show a falling-off of 27,000,000 francs,

almost entirely due to the re-modelling of the spirit duties, which took effect in January, 1901, and still continues to produce a deficit, though the increased spirit duties were expected to compensate for the remission of the wine, beer and cider duties. Tobacco shows an increase of 2,250,000 francs, and the death and stamp duties an increase of 6,000,000 francs.

Sulphate of Copper in Greece.—In view of the numerous reports that have been printed regarding a demand for sulphate of copper in Greece, the following remarks by the British Consul in the Morca are of interest:—Sulphate of copper has proved the only efficacious preventive of the *peronosporos* malady, which has caused such damage to the currant and vineyards during the last few years, and particularly in 1900. Mixed by a solution of water with slaked lime at the rate of 1½ to 2 per cent., it is sprayed over the vines four or five times during the spring and summer months. The area under currant and grape culture throughout Greece is reckoned at about 400,000 acres, and 50 lb. of sulphate of copper being required per acre for the proper treatment of the vines, about 9,000 tons would be required annually for this purpose, but it is doubtful if over 3,000 tons are imported altogether annually, as many of the poor class of proprietors, particularly in northern Greece and in the Islands, are unable to bear the expense. The Currant Bank, Patras, is the principal importer of sulphate of copper, and last year it accepted British tenders to the extent of 2,000 tons at the price of £23. 10s. per ton, c.i.f., Patras. A portion of the supply required for the present season has been purchased by the Currant Bank from the American Metal Company, Limited, at the price of £18. 10s. per ton c.i.f., Patras. Small sample shipments of various chemical powders and manures of British manufacture, intended to combat the *peronosporos oidium* and other maladies of the currant and grape vineyards, were imported last year, and tried on a small scale, but as all vineyards were unusually healthy throughout the season, it was not possible to judge of their efficacy. Greek growers, as a rule, are averse from any experiment of this sort; still, should any of these preparations, especially if cheaper than sulphate of copper, prove beneficial, there is no doubt that a large trade would result in time.

World's Consumption of Tea and Coffee.—From the second number of a Board of Trade memorandum dealing with the production and consumption of tea and coffee, it appears that the total consumption of tea in the United Kingdom exceeds that of all the European countries and the United States put together. During the seventeen years from 1884 to 1900 it has risen from 175 million pounds to 250 million, an increase of forty-three per cent. Out of about 600 million pounds exported in 1900 from China, India, Ceylon, Japan, and Java, nearly half (including seven-eighths of the Indian export and three-quarters of that of Ceylon) was imported by this country, and only a comparatively small proportion of this quantity was re-exported. The consumption per head is greater in Australia than in the old land. In Western Australia, where the record is made, the consumption in the year 1900 was more than 10 lb. per head, against rather over 6 lb. in the United Kingdom.

As to coffee, Holland takes the lead in consumption per head, with the United States as a distant second; the United Kingdom and her Colonies come low down in the list. As regards total consumption, the United States stands pre-eminent, the quantity of coffee there consumed being nearly as great as that of all the other countries taken account of in the statistics put together.

The quantities of tea and coffee imported for home consumption per head of the population in various countries is shown in the following table:—

Countries.	Tea.		Coffee.	
	1895.	1900.	1895.	1900.
	lb.	lb.	lb.	lb.
United Kingdom . . .	5'67	6'10	0'70	0'71
Australia . . .	7'48	7'81	0'49*	0'58
New Zealand . . .	6'46	6'78	0'40	0'27
Canada . . .	4'05	4'64	0'68	1'00
United States . . .	1'40	1'09	9'33	9'81
France . . .	0'04	0'06	4'13	4'66
Germany . . .	0'11	0'12	5'15	6'29
Austria-Hungary . . .	—	—	1'94	2'06
Russia . . .	0'74	0'93	—	—
Holland . . .	1'32	1'48	16'49	16'57
Belgium . . .	—	—	8'23	8'50

* 1896.

LABOUR MARKET.

UNITED KINGDOM.

Factories and Workshops.—Report for 1901.—It appears from the annual report of the Chief Inspector of Factories and Workshops for the year 1901 that the number of factories on the register at the end of the year was 97,845, and that of the workshops 143,065. These totals include laundries, but not men's workshops, docks, or warehouses. There were received 322,000 statutory reports from the occupiers of the premises under the Acts, 83,760 reports of accidents, 936 of poisoning (contracted in a factory or workshop), 167,000 of overtime. Fatal accidents were rather fewer than in 1900, this being the first interruption in the increase which had gone on year by year, from 455 in 1895 to 1,045 in 1900. But the accidents which were not attended with fatal results increased from 77,975 in 1900 to 82,725 last year. It is found that workmen often reject or misuse the guards provided for their safety, and that employers, while willing to comply with instructions given by the Inspector as regards the individual machines or parts of machines which he finds unguarded on his visit, commonly fail to adopt the same precautions in the case of new appliances of the same kind, and comparatively rarely take the trouble to require that new machinery shall be fenced by the maker. Legal proceedings were found to be necessary in no less than 3,770 instances—483 more than in the previous year. Four cases of phosphorus necrosis were reported in connection with the manufacture of lucifer matches. The twelve notified instances of arsenic poisoning included seven probably due to arseniuretted hydrogen, which occurred in galvanising works. In hatters' furriers' premises the conditions have improved since the issue of the departmental circular to occupiers in 1900. In connection with the hide and skin trades, the reports of anthrax rose from nine in 1900 to 20 in 1901, and this afforded an additional reason for the further action under special rules, directed more especially against the dangers of handling hides and skins from China and the West Coast of India. Manufacturers of horsehair have, for the most part, given up the use of China hair. It is pointed out that there are now in force 26 codes of special rules for different dangerous trades, and the enforcement of these in the 7,833 works in which they are established has called for a large and increasing number of special visits. In the main, the reports as

to these are satisfactory. As a result of the factory legislation of last year the Chief Inspector says: "Perhaps the most important change is that which affects 'any manufacture, machinery, plant, process, or description of manual labour' certified by the Secretary of State to be dangerous." In place of the former provisions for the establishment of special rules in particular works, a new power is given to the Secretary of State to make regulations of general application to all premises in which the dangerous work in question is carried on. Arbitration is abolished, but a public enquiry may be held after the regulations have been published in draft, and the final regulations are to be laid before Parliament. It is provided that they may prohibit or limit employment in dangerous work, or the use of any material or process; and may modify any special regulation contained in the Act. Existing special rules remain in force until repealed, the requisite sections of the 1891 and 1895 Acts being retained until a date to be fixed by the Secretary of State. A domestic factory or workshop in which any work certified by the Secretary of State to be dangerous is carried on, is now made subject to all the provisions of the Act as if it were an ordinary factory or workshop.

Statistics of Mining.—The General Report on Mines and Quarries in the United Kingdom for the year 1901 has just been issued by the Home Office. From this it appears that the total number of persons employed in and about all the mines of the United Kingdom was 839,178, of whom 806,735 worked at the 3,397 mines under the Coal Mines Act, and 32,443 at the 731 mines under the Metalliferous Mines Act. Compared with 1900 there is an increase of 26,683 persons at the mines under the Coal Mines Act, and a decrease of 2,022 persons at the mines under the Metalliferous Mines Act. At the quarries under the Quarries Act there were 94,188 persons employed, of whom 59,968 worked inside the actual pits or excavations, and 34,220 outside. Compared with 1900, there is a decrease of 663 among the inside workers, and an increase of 956 among the outside workers, making a net increase of 293 in the number of persons employed at quarries.

The total output of minerals at the mines under the Coal Mines Act was 231,343,224 tons, of which 219,037,240 were coal, 2,834,997 fireclay, 6,849,926 ironstone, 2,354,356 oil-shale, and 266,705 sundry minerals. Adding 9,705 tons from open quarries, the total output of coal was 219,046,945 tons, which is lower than that of the previous year by 6,134,355 tons. In 1900 the average output of minerals at mines under the Coal Mines Act was 382 tons per person employed underground. Last year the corresponding output was 357, a fall of 25 tons per man. The main cause of the decrease in the output per man, says Mr. C. Le Neve Foster, is to be found in the fact that the colliers worked fewer days, and sometimes shorter hours, in 1901 than they did in the previous year. In some cases higher wages enabled the workman to earn his livelihood though working shorter hours or taking an additional holiday every week; in other cases large numbers of men were taken into employment while trade was brisk at the beginning of the year and were afterwards kept on the books, the mine being worked for shorter hours. The total output of minerals at the mines under the Metalliferous Mines Act was 3,230,565 tons, of which 1,671,025 tons were iron ore. The total quantity of stone and other minerals obtained from the quarries under the Quarries Act was 40,701,869 tons, of which 2,424,951 tons were iron ore. Adding to the produce of mines and of quarries over 20 feet deep, 1,329,296 tons obtained from shallow open workings, there is a total output of iron ore of 12,275,198 tons.

COLONIES.

The monthly report, compiled by the EMIGRANTS' INFORMATION OFFICE, states that this is the best season of the year in which to emigrate to Canada, and a large number of persons have already arrived. There is an excellent demand for competent farm labourers and female servants. The building trades are busy, though a certain amount of unrest has been caused in Montreal, Toronto, and other large centres by demands of the employees for increased wages. Printers, and men in the cotton and woollen mills, are generally well employed. The lumber and shingle industry in British Columbia is very busy, but at the large coal mines of Nanaimo many miners are out of work.

Australasia (New South Wales).—Trade continues fairly busy both in building and construction work. Shipping has fallen off, and some wharf labourers have been thrown out of work. The drought is still severe, and many general labourers have come into the towns owing to the scarcity of work in the country. The cost of provisions is increasing. There is a sufficiency of miners at the Lithgow coal mines; the hewing rate is 2s. 6d. per ton for screened coal; bricklayers, carpenters and female servants are in demand. **(Queensland).**—Owing to the drought and other causes there is no demand for more labour in Queensland at the present time. **(Western Australia).**—The report of the Western Australian Government Labour Bureau for the quarter ending 31st March last shows as follows:—There is a demand for skilled men in the building trades at Perth, Fremantle, Northam, and York, but elsewhere the supply is sufficient, or more than sufficient; there is no demand for miners anywhere; there is a good demand for farm labourers in most districts in the South-West; the supply of general labourers is sufficient except at one or two small places like Northam, York, and Dongarra; there is a good demand for female servants. **(New Zealand).**—In Taranaki and Wellington there is a good demand for farm and general labourers and female servants. The building trades have been busy throughout the colony, except at Dunedin and a few smaller places. Men in the engineering trades have been fairly well employed except at Dunedin and Wellington. The clothing trade has, generally speaking, been very busy. The boot trade has been very slack at Wellington, but has been busy in many places. Flax millers have been busy. There is a good demand for milking hands. Competent general labourers find good employment.

South Africa (Cape Colony).—There is a demand for skilled mechanics, but not for farm or general labourers. No one may land without a permit, which must be obtained from the Permit Office, 47, Victoria-street, London, S.W. **(Natal).**—The following persons are wanted for the Government railways; free passages to Natal are provided; engagements are for 3 years; candidates must apply to the Agent-General for Natal, 26, Victoria-street, London, S.W., enclosing particulars as to age, height, whether married or single, with medical certificates and testimonials: Good platelayers between 25 and 40 years of age, with 5 years' experience, wages, £11 to £15 a month; locomotive firemen, between 23 and 27 years of age, and not less than 5 feet 7 inches in height, with 3 years' experience, wages, 8s. per day; carriage and wagon examiners having 3 years' experience, wages, 9s. a day; and carpenters, copper-smiths, coach body makers, and spring makers, wages, 12s. to 13s. a day. Trade generally continues good, and a considerable number of artisans have arrived. The carpenters' strike has been settled, the men agreeing to accept an increase of 1s. a day, instead of 2s., as at first demanded; wages, therefore, are now 15s. a day. The cost of living has increased. No one may land without a permit from the Permit Office, 47, Victoria-street, London, S.W. **(Orange River Colony and Transvaal).**—Only refugees, Government employees, and persons engaged in a service of a public nature, will be permitted to proceed to the Transvaal. Candidates for the

South African Constabulary should apply to the Recruiting Officer, S.A.C. Recruiting Office, King's-court, Broadway, Westminster, S.W.; they must be good riders, good shots, single, strictly sober, and from 20 to 35 years of age; they will be given free passages to South Africa. A few farriers also are wanted for this force.

FOREIGN COUNTRIES.

Distribution of Electric Power in Home Industries in Switzerland and France.—The Belgian Labour Department has published the result of an enquiry, undertaken by order of the Minister of Industry and Labour, as to the social and economic effects of the distribution of electrical energy in home industries. The investigation was carried out by M. Ernest Dubois, professor at the University of Ghent, and M. Armand Julin, of the Belgian Labour Department, who studied the system as it exists in the watchmaking industry of Switzerland, the silk-weaving industry of Lyons, and the ribbon industry of Saint-Etienne. Each of these industries forms the subject of a special monograph. The conclusion arrived at is, that the principal advantages of the factory system are impossible of attainment in home industries, and that the inherent inferiority of home work remains unaltered by the fact that the home-worker has mechanical power at his disposal. The chief grounds of this conclusion are that where work is carried out in workmen's homes, the division of labour, which is essential to the success of modern industry, meets with grave difficulties, and that home workers lack both the initiative and the capital necessary for that constant improvement of the manufacturing plant used, which is absolutely required by the pressure of industrial competition.—*Labour Gazette*.

EMIGRATION AND IMMIGRATION.

**** The Imperial Institute acts in concert with the Emigrants' Information Office (which is under the direction of the Colonial Office), of 31, Broadway, Westminster, S.W.; and also with the British Women's Emigration Association, now temporarily carrying on its work in rooms at the Institute. The Handbooks and Quarterly Circulars issued by the Emigrants' Information Office may be obtained at the Commercial Intelligence Office. Special information and practical advice respecting Canada and Cape Colony will also be furnished by the Curators of these Sections.**

UNITED KINGDOM.

British Women's Emigration Association.—The hon. sec. reports the number of applications received at the office between April 21 and May 21, as 675. Applications from employers have also been numerous, and many of them have been suited from the lists of approved persons, on the books of the Association. 58 have sailed in the month reported upon, 16 to Canada, 39 to South Africa, 2 to Australia, 1 to New York. A large party will leave for Canada on June 5, and another on the same day, per s.s. *Gothic* for South Africa and New Zealand.

Of the 200 Elementary School Teachers, sent out by the Government to the Concentration Camps in South Africa, 100 have been selected from Great Britain, 40 from Canada, 40 from Australia, and 20 from New Zealand. The Canadian contingent of young women arrived in England en route for Cape Town, during the past month, in two parties of 20 each, at a week's interval. The British Women's Emigration Association resolved to do its part towards making the short stay in England pleasant to their Canadian sisters. The president of the Liverpool Branch of the Girls' Friendly Society was on the spot to welcome them on landing; a delegate of the Education Sub-committee of the South African Committee received them on arrival at Euston; and a scheme of sight-seeing and entertainment was planned for each day of the week in London. The first party made an expedition to Oxford at the invitation of a member of the Council, and also spent a day and night at Winchester, en route to Southampton, where hospitality was provided for them and a complete inspection of the historic buildings of that ancient capital of England, arranged by the president of the Association and a local committee of ladies. The second party went down to Hatfield, the fine Elizabethan home of Lord Salisbury, in Hertfordshire.

On another occasion Mr. Chamberlain was so kind as to speak some encouraging words to the patriotic daughters of the Empire, whose influence in South Africa would be able to do much to promote feelings of mutual good-will and loyalty. One afternoon the visitors were entertained at tea, at The Imperial Institute, and they expressed themselves as much pleased and gratified with the attentions they had received while in London. They were quite fatigued with all they had done and seen—public buildings, theatres, picture galleries, and concerts, but they will have time to rest and think it all over, during the voyage to Cape Town, and these pleasant memories will cheer them amid their duties in the Camp and on the Veldt. It is satisfactory to hear that the Boer children show great eagerness to learn, and that no compulsion is necessary, to ensure their attending school regularly.

When the country becomes more settled, many teachers will be needed for country districts. Advice and information about these posts, and the qualifications necessary, can be obtained on application from the Education Sub-committee, at the office of the Association, as above.

Pulp Wood in Nova Scotia.—Nearly all the big paper and pulp enterprises which have been brought forward in Canada during the past few years have found their reason for existence in the pulp wood resources of the provinces of Ontario and Quebec. While something has been done in the manufacturing of pulp in Nova Scotia and New Brunswick, as yet no very large enterprise has originated in either of those two provinces during recent years. It now appears, however, that the pulp wood resources, as well as those of lumber, in Nova Scotia are coming into prominence. A syndicate, recently formed and composed principally of American capitalists, has just come into possession of a tract of 265,000 acres of valuable timber lands in Nova Scotia. The transfer is one of the largest recorded in connection with the lumber industry of the province. While the company will primarily devote its attention to the cutting of timber for the purpose of manufacturing it into lumber, it also intends ultimately to engage in the pulp and paper industry, and is already making plans to develop a large water power and build a pulp mill. As Nova Scotia is many hundred miles nearer to England than Ontario and all that portion of Quebec in which the pulp industry has thus far been developed, a manufacturer of pulp in that province should have a considerable advantage in the way of low freights in reaching the English market.—*Paper Mill*, New York.

CUSTOMS TARIFFS.

COLONIES.

British Central Africa Protectorate.—IMPORT DUTIES INCREASED FROM 1ST INST.—The Board of Trade have received from the Foreign Office a copy of a notice stating that, "on and after the 1st of June, the duties leviable on goods imported into the British Central Africa Protectorate will be raised from the present rate of 5 per cent. to 10 per cent. *ad valorem*. Goods consigned to persons in the said Protectorate and actually at sea, or in Chinde, on that date will be exempted from the increased rate."

British Guiana.—NEW CUSTOMS TARIFF.—The *Official Gazette* of British Guiana, dated 29th March, 1902, contains a copy of an Ordinance (No. 8 of 1902), fixing the tariff of duties on goods imported into British Guiana from the date of its publication to the 31st March, 1903.

The present Ordinance repeals Ordinances Nos. 1, 9, and 11 of 1901, while it, at the same time, re-imposes the rates of duty previously in force, with the exception of those on the following articles:—

Articles.	Rates of Duty.
Motor cars—not seating more than four	\$80*
For each additional seat above four	\$20*
Paints and colours ground in oils or any other liquid per cwt.	60 cents.*
Soap and soap powders, perfumed, fancy and toilet soaps, including medicinal and medicated soaps—	
Costing 6 cents per lb. and over per lb.	6 cents.*
„ less than 6 cents per lb., and not less than 4 cents per lb.	2 cents.*
All other kinds of soap	½ cent.*
Machinery for the reaping and preparation for the market of rice	Free.
Mowing machines when the Comptroller of Customs is satisfied that such are imported for agricultural purposes	Free.
Mechanics' tools in use	Free.
Pipes to be exclusively used for the sinking of artesian wells	Free.
Postage stamps	Free.

* With an additional charge of 5 per cent. on the duty leviable.

The Ordinance also provides that when "gunpowder, dynamite, fireworks or other explosives are imported for exportation, or in transit, no duty shall be levied thereon if the regulations relating to the treatment of the said articles are complied with.

Ceylon.—PROPOSED INCREASED EXPORT DUTY ON TEA.—The Board of Trade have received a draft of a proposed Ordinance providing for an increase of the export duty levied on tea, such duty being at present fixed at 20 cents per 100 lb.

The present draft Ordinance provides that a duty not exceeding 30 cents per 100 lb. shall be imposed upon all tea of the produce of Ceylon exported beyond seas from such time as the Governor shall, by proclamation published in the *Government Gazette*, appoint.

It also provides that the rate of duty leviable is to be determined by the Governor in Executive Council from time to time, upon consideration of such recommendations as may be made by the Joint Committee appointed by the Planters' Association of Ceylon and by the Ceylon Chamber of Commerce, or the successors in office of such committee, to administer the funds raised under the Ordinance, and such duty is to be independent of, and in addition to, the duty imposed under the provisions of "The Medical Wants Ordinance, 1880, amendment Ordinance, 1882."

Natal.—EXCISE DUTY ON SPIRITS.—The "Excise Act, 1901" (No. 33 of 1901), consolidates and amends the Laws relating to the manufacture, storage, conveyance, and sale of Colonial spirits and wines, and the methylation of spirits.

The Act came into force on 1st January, 1902, and, *inter alia*, provides that:

There shall be levied and paid for every gallon of spirits made in Natal, not exceeding the strength of proof by Sykes' hydrometer, a duty of 7s. 6d., and so in proportion for any greater or less strength.

[A rebate of duty may be granted on rectified spirits of wine made from spirits distilled in the colony and used by chemists or druggists in the preparation of medicines, perfumery, and non-potable articles.]

Methylated spirits made under the provisions of this Act from Colonial spirits, and wine made in Natal under a license, are exempt from duty.

The present Excise Act also provides that no wine made in the colony must exceed a strength of 40 per cent. of proof spirit, or be so fortified as to exceed that strength, otherwise it shall be liable to the Colonial spirit duty.

Licences are required to be obtained to keep or make stills, distil, rectify, or compound spirits, sell methylated spirits by retail, and make wine.

EXCISE DUTY ON BEER.—An Act passed by the Natal Government, dated 26th August, 1901 (No. 37 of 1901), provides for an Excise duty of 2d. per gallon upon beer sent out from a brewery in the colony, unless exported by sea or overland under such conditions as may be prescribed, when it is exempt from duty. The Act in question also provides for a Customs duty of 2d. per gallon to be imposed upon beer brewed in any Colony or State which is a party to a Customs Union with Natal, and imported into Natal by land or sea, but it is not to take effect until the Governor shall notify by proclamation that a protocol has been executed in terms of the South African Customs Union Convention of 1898, on behalf of all the colonies and possessions, being parties to the Union, agreeing to the imposition of such a Customs duty.

Copies of the above-mentioned Acts may be seen by persons interested on application to the Commercial Intelligence Branch of the Board of Trade, 50, Parliament-street, S.W., any day between the hours of 10 a.m. and 5 p.m.

EXPORT DUTY ON ANGORA RAMS AND EWES.—The "Angora Export Duty Act of 1901" (No. 12 of 1901), dated 30th July, 1901, provides for the imposition of a duty of £100 upon every Angora ram or ewe exported from Natal. The Act, however, provides that no such duty will be payable on the export of any such ram or ewe to any South African State which shall by its own Legislature have imposed a duty not less than the amount imposed by this Act. This Act is to take effect from a date to be fixed by proclamation, which shall not be made until the Governor shall have ascertained that the Governments of the Colony of the Cape of Good Hope* and of the Province

* The Cape of Good Hope Government has already made provision by an Act (No. 21 of 1899), which was promulgated on 13th October, 1899.

of Mozambique have made similar provision for prohibiting or restraining the export of Angora rams and ewes.

St. Lucia.—PROHIBITIONS.—An Order in Council, dated 10th April, 1902, prohibits, under Section 109 (1) of the Customs Ordinance, 1888, the importation of all cattle into St. Lucia from Porto Rico, except under the following conditions:—

(1) That the master of the vessel in which such cattle are imported shall, on arrival at this port, cause such cattle to be examined by the Health officer in such manner and at such place as the Health officer may require and at the cost of the master of such vessel.

(2) That such master shall obtain a written certificate from the Health officer that such cattle are free from glanders and shall produce such certificate to the treasurer.

A copy of a Proclamation, dated 3rd April, 1902, has also been received prohibiting the importation into the colony, directly or indirectly, of any cocoa plants or parts or portions whatever of a cocoa tree, from the Continent of South America, east and south of the Isthmus of Panama.

INDIA.

Drawback of Duties on Articles Re-exported by Parcels Post.—Customs Circular (No. 8 of 1902), issued by the Finance and Commerce Department of the Government of India on 20th March, 1902, notifies that:

"The Governor-General in Council sanctions the payment of drawback in the case of all articles re-exported by parcels post, in whatever manner imported, provided that adequate proof is produced of the payment of import duty, of the identity of the articles, and of their re-export being effected within two years from the date of importation, or within such extended term not exceeding three years as the Chief Customs Authority, on sufficient cause being shown, determines in any case."

France and Indian Produce.—The following has been issued by the Finance Department:—"An intimation has been received from His Britannic Majesty's Embassy at Paris, that by law passed on the 21st February last the French Government has been authorised to allow, provisionally, for another year, *i.e.*, till the 23rd February, 1903, the minimum tariff for Indian produce."

FOREIGN COUNTRIES.

China.—REDUCTION OF EXPORT DUTY ON TEA.—A telegram from H.M. Special Commissioner for the negotiation of a new Commercial Treaty with China states that the Chinese Government have decided to reduce the export duty on tea to a rate of or equivalent to 5 per cent. *ad valorem*, and that the Chinese Customs at Shanghai have advertised that the intended reduction will come into force shortly.

Egypt.—VALUATION TARIFF FOR BAGS, TWINE, ETC.—The Egyptian *Journal Officiel* for the 16th April contains the text of a Valuation Tariff* in use by the Customs Authorities of Egypt, for the purpose of assessing Customs duties on bags, jute cloth, twine, etc., imported. The Tariff, which is as follows, came into operation on the 17th ult., and will continue in force for 12 months:—

Articles.	Valuations† per kilog.	Millièmes.‡
Hessian jute or hemp sacks, made of plain cloth, common quality	(Indian)	21½
	(English)	26
Twilled hessian jute or hemp sacks, common quality	(Indian)	14
	(English)	17
Hessian jute or hemp cloth, plain or twilled, common quality, not exceeding 4½d. per yard for the plain		25
Jute or hemp untwist twine (the produce of the United Kingdom or of British Colonies)		20½
Old sacks		12

*The Valuation Tariffs are fixed by agreement between the Customs Administration and the principal merchants concerned, and may be denounced by the Administration or by the merchants not later than a fortnight before the lapse of the period for which they were framed. If not so denounced they remain in force for a further term.

†Duty is charged on these valuations at the rate of 8 per cent.

‡Millième= $\frac{1}{1000}$ th part of the Egyptian £, which=£1. os. 6½d.

VALUATION FOR RANGOON RICE.—The Egyptian *Journal Officiel* for the 30th April, contains a notice issued by the Direction-General of Customs, to the effect that Rangoon rice will, from the 1st ult. to the 31st October next, be valued for Tariff purposes at 660 millièmes (13s. 6½d.) per sack of two cwt. net.

France.—CUSTOMS DECISIONS.—Circulars, recently issued by the French Customs Department, contain the following decisions affecting the application of the French Customs Tariff:—

Leather dressing, composed of tallow and paraffin wax, is assimilated to "petroleum residues," dutiable at the rate of 9 frs. per 100 kilogs. net (3s. 8d. per cwt. net), provided that (i) the proportion of insaponifiable paraffin does not exceed 45 per cent., and (ii) that its fusion point is not higher than 48 degrees.

Salt in sacks.—Article 37 of the Finance Law for this year provides that all bags of salt presented for verification at a Custom-house or office of indirect taxes must be of a uniform and invariable weight of 50, 75, or 100 kilogs. Exception will be made in favour of small quantities, the weight of which does not exceed 25 kilogs.

INCREASE OF IMPORT DUTY ON CIGARS AND CIGARETTES.—The French Finance Law of 30th March last provides that cigars and cigarettes imported on private account are to be dutiable at the rate of 50 frs. per kilog. instead of 36 frs. as formerly, *i.e.*, 18s. 2d. instead of 13s. 1d. per lb. The new rate came into force on the 1st ult.

IMPORT DUTIES ON "COLONIAL PRODUCE."—Relative to the French import duties on "colonial produce," according to a Circular recently issued by the French Customs Department, "colonial produce" is subjected to the operation of the "General" or maximum tariff when produced in any of the following countries:—Portugal and Portuguese Possessions, Malta, Gibraltar, Heligoland, Ecuador, Chile, the Philippines, Cuba, the Dutch West Indies, British and Dutch Guiana, Australia, New Zealand, and the British West Indies other than Jamaica.

Norway.—TARIFF ALTERATIONS.—A despatch from H.M. Co sul-General at Christiania contains the following list of

changes which have been made in the Customs Tariff of Norway, taking effect from the 1st April:—

Tariff No.	Articles.	Duty per kilog.	
		Old Rate.	New Rate.
		Kron. öre.	Kron. öre.
1142	Transformers (formerly included in 1146)	Free	5% <i>ad val.</i>
142 (3)	Fruits, salted or preserved in vinegar—		
	(a) Fruit and orange peel, preserved in brine	0 75	0 10
	(b) Tamarinds, with or without vinegar	0 20	0 20
	(c) Other	0 75	0 75
160 (a)	Photographic plates	Not tariffed	0 30
166	Electric incandescent lamps	"	1 50
—	Camphor	"	Free
257	Clothing, as well as sewn parts thereof, even when not entirely finished—		
	A.—Linen, even coloured or printed, imported starched (including paper, boxes, and other packages)	1 35	1 75
585	Syrup containing over 25 per cent. of glucose	Free	0 20
	Wood and wooden wares—		
New article	(e) Clothes' pegs	0 07	0 25
	NOTE.—The sections of the "Wood" schedule formerly numbered 10 (e) and 10 (f) are now 10 (f) and 10 (g) respectively.)		

NOTE.—Kilog.=2·2046 lbs. Krone=100 öre=1s. 1½d.

Peru.—PROHIBITION TO IMPORT CERTAIN ARTICLES OF FOOD.—The Board of Trade are in receipt, through the Foreign Office, of a translation of a Peruvian Decree, dated the 14th March, 1902, prohibiting the importation into Peru of articles of food preserved with boric acid.

Russia.—TARIFF CLASSIFICATION OF INCANDESCENT ELECTRIC LAMPS AND OF "PEGAMOID," ETC.—The Russian Customs Department have notified that incandescent electric lamps of glass and china, with metallic attachment, are to be dutiable under Section 169 of the Russian Customs Tariff, at the rate of 10 rubls. 20 cop. per pound (7½d. per lb.). A further notification is to the effect that "pegamoid" and "dertamoid," consisting of a tissue covered with a layer of chemically prepared cellulose, are dutiable, on importation into Russia, under the sections of the Tariff corresponding to the nature of the tissue.

United States.—CUSTOMS DECISIONS.—The following is a list of some Decisions affecting the classification of articles under the United States Customs Tariff, which have recently been issued by the Treasury Department at Washington:—

Cylinders for use in boilers.—Welded, corrugated or ribbed, iron or steel cylinders, so-called, invoiced as "boiler flues" or "Purve's ribbed steel boiler flues," are dutiable as "welded cylindrical furnaces, made from plate metal," under the second clause of para. 152 of the Tariff, at the rate of 2½ cents per lb. (11s. 8d. per cwt.), and not as "boiler tubes, pipes, or flues," under the first clause of the same para.

Paintings, the work of an American artist temporarily residing abroad, are free of duty under para. 703 of the Tariff, without regard to the length of the artist's absence.

Iron sheets or plates, valued at more than 3 cents per lb., are dutiable under para. 193 of the Tariff, at the rate of 45 per cent. *ad val.*, together with the additional duties (of ½ cent. per lb. in each case) which may be leviable under para. 132, or the proviso to para. 133, if the sheets or plates are cold-rolled, or galvanised, or both.

Preparations of tallow, used simply for softening cotton cloth, are held not to be "alizarin assistants" within the meaning of para. 32 of the Tariff, but to be dutiable under Section 6, as unenumerated manufactured articles, at the rate of 20 per cent. *ad val.*

Dulcin is not dutiable as saccharine, but as a chemical compound, under para. 3 of the Tariff, at the rate of 25 per cent. *ad val.*

Silkworm gut for use in the manufacture of "snells" or "leaders" for fishing lines, and *catgut strings* intended to be made into surgical sutures, ligaments, etc., are free of duty, under para. 517 of the Tariff, as "worm gut or catgut, unmanufactured."

Breccia,—Marble, in blocks or slabs, of a quality commercially known as "breccia," is free of duty under para. 508 of the Tariff.

Sulphide of antimony, crude, is free of duty under para. 476 of the Tariff. The word "sulphite" in the text of that para. is a misprint for "sulphide."

Copper matte is free of duty as copper regulus, under para. 534 of the Tariff.

Canned fish roe, subjected to heat in preparation, and designed for use as a food, is dutiable at the rate of 20 per cent. *ad val.*, as an unenumerated manufactured article, under Section 6 of the Tariff.

FORFEITURE OF SPIRITS, ETC., IMPORTED FROM CANADA.—With reference to the forfeiture of spirits imported from Canada into the United States in casks containing less than 100 (or, in some cases, 35) gallons, it is notified in a recent Circular of the United States Treasury Department, that the prohibition against such importation does not extend to *wines*, provided that they contain not more than 24 per cent. of alcohol. Wines containing more than that proportion of alcohol are, in virtue of the first proviso to para. 296 of the Tariff, classed as spirits, and are subject to the same regulations as regards forfeiture as spirits.

DRAWBACK ON MANUFACTURED ARTICLES.—According to a recent circular of the United States Treasury Department, the assembling and putting together of imported parts of furniture intended for re-exportation in the completed state does not constitute a manufacture entitling the exporter to drawback of the duty paid on the imported parts under Section 30 of the Tariff.

WAR-REVENUE TAXATION REPEAL, ETC.—The Board of Trade have received, through the Foreign Office, a copy of an Act approved by the President of the United States on the 12th ult., which repeals certain additional taxation imposed by the "War-Revenue Taxation" Acts of June, 1898, and March, 1901.

TEA.—Section 7 of this Act repeals the stamp tax on entries of imported goods from the 1st July next, while Section 10 repeals the duty of 10 cents per pound on tea imported from

foreign countries, his latter provision taking effect from the 1st January, 1903.

TOBACCO.—By Section 3 of the Act, the Internal Revenue duties on snuff and manufactured tobacco, other than cigars and cigarettes (leviable also on imported tobacco and snuff in addition to import duty proper) are, from the 1st July next, to be reduced from 9½ cents to 6 cents per pound; while those on cigars and cigarettes (also leviable on imported cigars and cigarettes) are fixed as follows:—

	Dols.	Cts.
Weighing more than 3 lb. per 1,000—		
Cigars	per 1,000	3 00
Cigarettes	"	3 00
Weighing 3 lb. or less per 1,000—		
Cigars	per lb.	0 18
Cigarettes of a wholesale value or price not exceeding 2 dols. per 1,000	"	0 18
Do., do. exceeding 2 dols. per 1,000	"	0 36

TRANSPORT AND FREIGHTS.

The Freight Market.—Outward coal rates are fairly steady in most directions, and River Plate shows a distinct improvement. Last fixtures have been on basis of 6s. 3d. Genoa, 7s. Venice, 5s. 9d. Constantinople or Port Said, 6s. 6d. Las Palmas, 16s. South Africa, 14s. River Plate, 12s. 6d. Rio. America is quiet. The demand for grain from Atlantic ports has eased off. California has paid 40s. oats to South Africa. Australia has paid 55s. 6d. hay and 30s. 6d. oats to South Africa. Newcastle—Philippines open at 12s., Java 9s. Black Sea quiet. Odessa quoted at 8s., Sulina 8s. 3d. Eastern markets quiet. Java has taken several boats at 23s., but has now ceased chartering. Calcutta and Rangoon are quoted at 18s., a fall of 2s. Mediterranean markets are unchanged. River Plate quiet at 9s. Buenos Ayres, 12s. 6d. San Lorenzo.—WEDDEL, TURNER & Co., May 23, 1902.

COLONIES.

Australia.—TRANSCONTINENTAL RAILWAY CONNECTION.—Mr. Oscar de Satgé, writing to the *Times*, under date April 26, discusses the advantages to be afforded by a through railway connection from Sydney northwards across the Australian continent. He says:—"This line is already in work for 500 miles between Sydney and Bourke, in New South Wales, and it would thence connect in a northerly line the inland Queensland townships of Conamulla, Charleville, Longreach, Winton, and Cloncurry, from which last point to Normanston, in the Gulf of Carpentaria, a concession by a recent Queensland Act of Parliament has been granted to an English company for the construction of a railway line of 250 miles, chiefly for mineral purposes. . . . The chief advantages of this line to Sydney and other southern markets would be a certain supply of meat from the vast Queensland pastures which can only now be reached by stock which leave their condition on the road by a tedious and expensive overlanding process. New South Wales, in the opening of this line of communication, would greatly benefit by sending north its stud stock to a certain market. Passengers for Batavia, China, Japan, etc., whether on business or pleasure, would in most instances prefer the direct overland route to the long coastal trip on an often troubled sea. To Queensland the advantage of the line would be greater still, as it would immediately connect the Queensland western termini of Charleville, Longreach, and Winton lines which push inland from Brisbane, Rockhampton, and Townsville, respectively; and this advantage, especially in seasons of drought, would be enormous. The meat markets of the south would be thus opened to Queensland in a regular way, and many other inter-State advantages would accrue which need not be enumerated. The engineering difficulties of the line are nil. There are neither mountains nor rivers to cross, it is all chiefly black soil plains of saline, and therefore fattening quality, whilst last, but not least, the country traversed is chiefly of cretaceous formation and favourable to artesian supply, much of the country to be traversed having already been developed by this means. There are bush fires and droughts to encounter, no doubt, but railway communication can be made greatly to check and counterpoise the dangers of such, whilst the civilizing and protecting influence of such a line can hardly be expressed, for it is untold."

Canada and the West Indies.—The Dominion Government has made a contract with the Halifax and West Indian Steamship Company for a monthly service between Halifax and Jamaica, which will continue in force until December the 31st, 1906. The steamer to be used is the *Beta*, of 1,037 tons register. The Company is to receive a subsidy of \$13,800 per annum, or at the rate of \$1,150 a trip for twelve trips.

Cyprus.—Navigation dues have been abolished in Cyprus, and a new law enacted substituting for them the payment of quay dues on the loading or discharging of certain articles of import and export.

Port Said.—It is reported that there is a large scheme on foot to promote the expansion of trade to and from Port Said, and to have a system of docks constructed on the African side of the port. It is maintained that, with the anticipated great increase in the crops due to the irrigation system which the Barrage on the Nile, now rapidly completing, will promote, the present shipping facilities at Egypt's only port, viz., Alexandria, will be insufficient. There will then be a great opportunity for Port Said, which can tap a district geographically better served *via* Port Said than Alexandria for both imports and exports, more particularly the latter. A period of about three years would be required to construct the dock system proposed, during which time it is expected that there will be a decided increase in the quantity of cotton, onions, sugar, etc., produced in Egypt, and naturally the imports will grow likewise. Port Said, from its position, will serve as a transit depot for transshipment of cargo to all quarters of the world. At the present time there is a transit trade of some importance, chiefly in Calcutta and Rangoon produce for Mediterranean ports, whilst Syrian cargo is also transhipped to U.K. or Continent, and some few shipments of Egyptian cotton have during the last year or two been sent *via* Port Said to Liverpool.

West Indies.—MANCHESTER AND JAMAICA.—Messrs. Elders and Fyffes, Limited, the great fruit importers, have definitely decided to run a regular direct line of steamers, with fortnightly sailings, from Jamaica to Manchester, carrying bananas and other Jamaican fruits, which will be distributed from the Manchester docks to all the principal centres in the North of England and the Midlands. The first steamer is expected to arrive at Manchester early in July.

INDIA.

Railways.—The Indian mail has brought a summary of the results of the working of the Indian railways for the official year which ended on March 31. It shows, the *Pioneer* of Allahabad remarks, that even the revised Budget estimate of

increased earnings was below the mark. The gross receipts from all lines were nearly 25,350,000 rupees higher than those of the preceding year, though the number of miles of new line completed was only 459. The North-Western State Railway has mainly contributed to this "splendid return," for the increased earnings on that system alone exceed 10,050,000 rupees. Then comes the Great Indian Peninsula, with an improvement of nearly 5,500,000 rupees; the East Indian running third with 3,300,000 rupees. Thereafter the rate of increase falls; but still there is the Oudh and Rohilkhand, showing an increase of nearly 1,700,000 rupees; the Bengal and North-Western, 1,600,000 rupees; the Southern Punjab and South Indian, each with about 1,200,000 rupees increase. Taking increases below 1,000,000 rupees, there are the Madras Railway and the Hyderabad-Godavari-Valley line, each more than 800,000 rupees to the good. The latter is a new line, and it is most satisfactory to note the expansion of traffic upon it. The Burmah railways have gone ahead with increased receipts of 650,000 rupees, and the Rajputana-Malwa system is better by nearly the same amount. The Delhi-Umballa-Kalka line has improved its earnings from 1,400,000 to 1,800,000 rupees. On the other side of the account the greatest falling off is in the case of the Bengal-Nagpur system, which is worse by nearly 800,000 rupees, the Southern Mahratta being second by just under 750,000 rupees. The Bombay, Baroda, and the Nizam's Guaranteed States lines are each some 50,000 rupees below the figures of the preceding year; the Indian Midland about 375,000 rupees, and the Eastern Bengal nearly 350,000 rupees worse. Reviewing the figures, the conclusion is that the big export of grain from the Punjab through Karachi and the revival of traffic on the Great Indian Peninsula system, with Bombay as its port, were the features of the year. The grand total of gross earnings on all lines was close upon 340,000,000 rupees, over an open mileage of 25,045. This "is an enormous sum, and the Government of India may well congratulate themselves on the prosperous state of the majority of the lines."

FOREIGN COUNTRIES.

China.—The M. Jebsen Steamship Ownery, of Apenrade, has established a regular cargo-boat service on the coast of China between Hong Kong, Tsingtau, and Newchwang.

Cheaper Freights to the East.—An official announcement has been made to the effect that the rate of freight by the China Conference boats is to be reduced 10s. per ton for Lancashire and Yorkshire goods, with a further special reduction for grey drills and grey sheetings, to meet, evidently, the American competition. This result, it may be taken, is a direct outcome of the interview which the Committee of the Manchester Conference on "Shipping Rings" had with Mr. Alfred Holt, at Liverpool, a week or two ago. On representations made by Manchester merchants the rate was reduced 10s. per ton on November 1 last. This further abatement thus brings the freight charge down 20s. per ton, as compared with that ruling twelve months ago, the rate then being 65s. per ton of 40 cubic feet. The statement has been received with great satisfaction by shippers to the Far East.

France.—BOULOGNE HARBOUR.—The Boulogne harbour extension, authorised in June, 1900, has been commenced, and works are actively carried on. Much of the inland end of the south-west pier will be removed, and a tidal basin formed. Of this, only one side will be completed under the present contract. These works will give a quay extension of over 400 yards, with a minimum depth from the harbour entrance of 13 feet below low-water mark. Three hundred and twenty metres of quay will be dredged to 25 feet below low-water mark. The cost of these works will be £240,000.

Holland.—STEAMSHIP LINE IN THE EAST.—The Bill placed before Parliament by the Dutch Government relating to the creation and subsidising of a monthly line of steamers between the Dutch East Indies and Hong Kong, Yokohama, Kobe and Amoy, has now been passed by the Second Chamber.

Russia.—The German Ambassador at St. Petersburg, reporting on the new Russian law relating to harbour dues, says that vessels belonging to countries having trade and navigation treaties with Russia will enjoy the same rights in Russian ports as Russian vessels, so that ships of those countries engaged in regular voyages between Russian and foreign ports will, under the new *régime*, only have to pay the dues once during the navigation period.

Somaliland and Abyssinia.—The railway from the port of Jibuti, in French Somaliland, to Harar, in Abyssinia, about 200 miles, is nearing completion. A correspondent of the *Times*, in the issue of May 21, calls attention to the fact that this railway will cause the diversion of the trade of the ports of Zeila and Berbera, in British Somaliland, to the French port of Jibuti, and points out the need for a railway from Berbera to Harar, in order to prevent British Somaliland being cut off from the interior, its natural source of trade, and the languishing, and eventually the extinction, of the trade of Berbera.

OFFICIAL AND COMMERCIAL CONTRACTS. UNITED KINGDOM.

Langport.—TENDERS are invited, until the 9th inst., for (Contract No. 1) Supplying and laying about 13 miles of 5 in., 4 in. and 3 in. cast-iron mains; (2) The construction of a covered service reservoir, engine house, etc.; (3) Air lift installation. Particulars (£2. 2s.) may be obtained from the Clerk to the Council, Langport, or from Messrs. Bailey, Denton, Son, Lawford and Symons, Palace-chambers, Westminster.

London (Fulham).—TENDERS are invited, until the 5th inst., for the SUPPLY, DELIVERY and ERECTION on the parish electric lighting premises, of (Contract No. VII) PIPEWORK. Particulars (£5. 5s.) may be obtained from F. Hastings Medhurst, 13, Victoria-street, Westminster. (West Ham).—TENDERS are invited, until the 10th inst. for the PAVING of the sides of roads on tramway routes. Particulars (£5) may be obtained from Mr. John G. Morley, borough engineer, Town-hall, West Ham.

Wallasey.—TENDERS are invited, until the 19th inst., for the CONSTRUCTION of a COVERED SERVICE RESERVOIR (capacity, four million gallons), and a WATER TOWER at Gorsehill, New Brighton, Cheshire. Particulars (£10) may be obtained from the engineer, Mr. J. H. Crowther, Great Float, near Birkenhead.

COLONIES.

New South Wales.—The time for the receipt of TENDERS for SYDNEY HARBOUR BRIDGE has been extended until the 30th inst.

INDIA.

Allahabad.—COMPETITIVE DESIGNS are invited for the ERECTION of a MEMORIAL to Queen Victoria, at Allahabad. The memorial is to take the form of a statue of the Queen, combined with a clock tower. Designs should reach the honorary secretary H. Nelson Wright, Allahabad, by 1st November next.

Bengal-Nagpur Railway.—TENDERS are invited, until the 6th inst., for axle-boxes, axle-guards, etc., rubber springs, shackles, etc., castings. Particulars may be obtained at the Company's offices, 132, Gresham-house, Old Broad-street, E.C.

East Indian Railway.—TENDERS are invited, until the 4th inst., for the SUPPLY of COPPER PLATES. Particulars (£1. 1s.) may be obtained from the secretary, Nicholas-lane, London.

Great Indian Peninsula Railway.—TENDERS are invited, until the 5th inst., for the supply of STORES. Particulars may be obtained from the secretary, 48, Copthall-avenue, London.

FOREIGN COUNTRIES.

Brazil.—TENDERS are invited by the Brazilian Ministry of Industry and Public Works, until the 19th August next, for the CONSTRUCTION of IMPROVEMENT WORKS at the port of Recife (Pernambuco).

Denmark.—The Engineer-in-Chief of the Danish State Railways invites TENDERS, until the 9th inst., for the SUPPLY of about 6,400 tons RAILS and FASTENINGS. Particulars (5s.) may be obtained at his office, 11 Colnhjörnsensgade, Copenhagen B.

Egypt.—TENDERS are invited, until the 28th inst., for the SUPPLY of PAPER and ENVELOPES for the Government Departments during the years 1903, 1904 and 1905. Particulars may be obtained at the Ministry of Finance, Cairo. TENDERS are invited by the Egyptian Public Works Department, until the 30th inst., for SUPPLYING and FIXING GLASS and IRON BOOK-CASES and EXHIBITION CASES at the Khedivial Library, Cairo. Particulars may be seen at the Commercial Intelligence Branch of the Board of Trade, 50, Parliament-street, Westminster.

Norway.—TENDERS are invited for the SUPPLY of 242 AXLES with WHEELS, 52 WHEEL CENTRES, and 270 WHEEL "BANDAGES," for the Norwegian State Railways, to be addressed to "Styrelsens Expeditionskontor, Statsbanerne, Christiania," where they should be received not later than 3 p.m. on 17th inst. Tenders should be enclosed in sealed envelopes, marked "Hjul." A receipt is given for the safe delivery of the tender. No responsibility is taken where a tender is delivered without a receipt being obtained for it. Tenders sent in by telegraph, or telegrams sent in to modify tenders already despatched, must bear the above mark immediately after the address. Tenders or telegrams bearing on tenders which do not bear the above mark, or which arrived too late, will be disregarded. The right is reserved to accept part or all of any tender, or to refuse them all. Drawings and conditions of tender can be seen at the office of the Head of the Engineering Department, Christiania. Apart from the usual Customs duties, a preference of from 10 to 15 per cent. is given to native manufactures.

COMMERCIAL LAW INTELLIGENCE.

Demurrage.—This was an appeal from a judgment by Mr. Justice Bigham. The Aktieselskabet *Shakespeare* sued Messrs. Ekman & Co. for eight days' demurrage. By a charter-party dated 20th July, 1900, the *Shakespeare* was to load a cargo of deals, battens, and firewood in the Skelleftea district for London. The cargo was to be discharged at the rate of 18 fathoms per day of ordinary working hours; ten days on demurrage over and above the lay-days at £8 per day; and the lay-days to commence the day after the vessel was in a berth in dock and ready to discharge, general strikes excepted. The vessel was ordered to the Regent's Canal Dock, and was berthed and ready to discharge on 14th October. The cargo consisted of 256 fathoms, which at 18 fathoms per day gave 15 lay-days. The discharge was not finished till the 9th November. Defendants contended that the discharge was prevented by a "general strike" of lightermen, and that they were not, therefore, liable for any demurrage. Plaintiffs contended that there was only a partial strike of lightermen. Mr. Justice Bigham had held that there was a general strike of the lightermen who would in the ordinary course be employed in the discharge of such a cargo as that carried by the vessel, and that this strike prevented the discharge. He had given judgment for defendants. Plaintiffs now appealed. Their lordships dismissed the appeal. Lord Justice Vaughan Williams held that if there was a strike against all the masters, and if that strike was taken part in by the workmen irrespective of the masters for whom they were working, that amounted to a general strike. On the evidence it was, he said, plain that there was a general strike among the lightermen in the port of London.

Foreign Securities and Income Tax.—The point raised in the appeal case of the GRESHAM LIFE ASSURANCE COMPANY, LIMITED, v. G. H. BISHOP (surveyor of taxes), related to the assessment for income tax of interest received from foreign securities. The Commissioners of Income Tax claimed that the company, who do business abroad, were liable to pay income tax on the gross amount received by them, whether in Great Britain or abroad, as interest, dividends, rents or other annual payments. The Divisional Court and the Court of Appeal both decided against the company, who appealed to the House of Lords. The appellants contended that the society was only liable to pay on interest actually received in Great Britain. The Lord Chancellor, in giving judgment, said that the question seemed to him to depend upon the actual words used by the Legislature. He declined to go beyond the words used, and he did not think that any amount of bookkeeping or treatment of these assets, wherever they might be, would be equivalent to receiving the amount in this country. The other noble and learned lords delivered judgment to the same effect. The appeal was allowed, and the judgment of the Court of Appeal reversed.

Negotiability of Crossed Cheques.—At the Thame County Court judgment was given by Judge Snagge in the case of THE BUCKS AND OXON BANKING COMPANY, LIMITED, v. NEWMAN, in which an important question with reference to the negotiability of crossed cheques was raised. The plaintiffs were bankers, whose business has been recently acquired by Lloyds Banking Company, Limited, and the defendant, Mr. William Newman, was a corn dealer, residing in London. The facts of the case, which were practically not in dispute, were, shortly, as follows:—On August 28, 1901, a man named George Jackman presented himself at the Thame branch of the plaintiff company and produced to their cashier and clerk, a Mr. Robinson, to whom he appears to have been previously known, two cheques for £20 and £2 respectively, requesting that he might have cash given him for them. They were admittedly drawn by the defendant Newman upon the Clapham Junction branch of the London and County Banking Company, Limited, to the "order" of Jackman, and were crossed generally, i.e., by parallel lines and the words "& Co." Mr. Robinson, in his evidence, stated that he knew that Jackman was not a customer of the bank, but that the bank sometimes changed cheques for him. "So," he said, "we cashed them for him"—that is, "he handed them in duly endorsed and I gave him the face value." The plaintiffs admitted that they were bound by the act of Robinson, their cashier, so far as he was acting within the scope of his duty. Mr. Robinson crossed the cheques

"specially" to the London and Westminster Bank, Limited, the London agents of the Bucks and Oxon Bank, Thame, and they went up by that night's post to the Louthbury branch of the London and Westminster Bank, where they were presumably received on the morning of the 29th. They were returned to the plaintiff company's bank marked "orders not to pay." Jackman refused to refund the money, and, according to Robinson, the Bucks and Oxon Bank did not sue him because he was not so well able to pay as the drawer of the cheque. Newman alleged that the cheques had been obtained by fraudulent misrepresentation, and that he was entitled to prevent their being honoured by his own bankers. In giving judgment his Honour assumed that Jackman's title to the cheques was not such as would give him a right to retain the money if he were sued. The plaintiff company cashed the cheque not as bankers, but as a corporation possessed of money. The cheques were taken in good faith for value, and came into the hands of the present plaintiff company as holders in due course. He was inclined to agree that it was undesirable that local bankers on market days should hurriedly cash crossed London cheques for "dealers," but the defendant might have written across the cheques the words "not negotiable." He gave judgment for the plaintiff company.

Rating of Machinery.—A case of great importance to manufacturers was CROCKETT & JONES v. NORTHAMPTON UNION ASSESSMENT COMMITTEE and OTHERS. Messrs. Crockett & Jones occupied a boot manufactory in Northampton, and were rated at £825 gross estimated rental and £550 as net annual value. On their premises was machinery used for the business, some of which was fixed to the freehold, as to which no question arose. The other was the property of, and repaired by, the tenants, and was composed of patent machines on which premiums and royalties were paid by the tenants, and of free machines. Many of the patent machines had no real market value, and were leased for 20 years with covenants as to royalties on payment of a premium. None of the tenants' machinery would be part of the premises on a demise by the landlord, or be considered in fixing the rent, and all of it was easily removable without injuring the fabric; but it was all essential to the manufacture. Most of it required to be steadied for working by being fixed by nuts or bolts; but none of it was attached to the freehold. Messrs. Crockett & Jones appealed to Quarter Sessions, and it was then agreed that the rateable value of the land should be £31, of the fixed machinery £39, and of the buildings £275. The Assessment Committee stated that the £275 was for buildings only, and they claimed to add a percentage upon the capital value of the tenants' machines, in the case of the patent machines by valuing the premiums and the royalties. This percentage they estimated at 5 per cent. and in respect of it they claimed to add £205 to the £275. Messrs. Crockett & Jones, on the other hand, stated that they had taken into account the suitability of the premises for such machinery and the fact that it was there, and they put their estimate at £185 without it. The Recorder found the value to be £31 for the land, £39 for the fixed machinery, £202 for buildings without machinery, and £127 for the tenants' machinery, in all £399. A case was then stated by the Court of Quarter Sessions for the Court of King's Bench, and the question was whether the tenants' machinery or any part of it ought to be taken into account, and if so, on what principle. The case was argued before a Court consisting of the Lord Chief Justice, Darling and Channell, J.J.; and the Lord Chief Justice, in giving judgment, said that it was now settled that if there was machinery in a building which made it fit for a particular trade or manufacture and the machinery was intended to remain permanently, it was a question of fact whether the machinery enhanced the rateable value of the building. It was clear that machinery which would last only a short time was different from machinery of a large and heavy description which could not be replaced without deranging the premises. The suitability of the premises for the machinery, and the fact that it was there, ought to be taken into account. The valuation of the machinery, however, ought not to be separate when the result was arrived at. The result was that the case must go back to the Recorder that he might assess the amount of the enhanced rateable value, if any. The question, what part of the tenants' machinery should be included, was entirely one of fact.

BRITISH CONSULAR REPORTS.

China (Samshui).—In the recently published report on the trade of Samshui for the year 1901 the Acting British Consul at that port writes as follows:—

"Some circulars and enquiries as to openings for trade having been addressed to me, it may save enquirers time and trouble if I state here that little, if any, assistance can be given by this Consulate. There is no business done locally, the port being merely a place of transshipment. There is no resident foreign merchant, and only a few native brokers to pass the goods through the Customs. The cargo as a rule is not even landed, being usually transhipped from steamer to junk, and *vice versa*, and forwarded to destination. The advent of the Canton-Hankow railway, the construction of which will, it is reported, be shortly commenced, may, however, be expected to introduce a material change in the conditions now obtaining, and give an impetus to trade which cannot but add to the importance of the port.

"The almost entire absence of social intercourse between foreigners and natives, combined with the suspicious and often unfriendly attitude assumed towards enquirers, especially if they happen to be officials, render it very difficult to obtain information, and almost impossible to acquire the intimate knowledge of the commercial affairs of the country and the wants and tastes of the people which is necessary to enable one to offer useful and practical suggestions for the extension of trade. cursory observations, however, seem to show that there is a wide demand for many kinds of miscellaneous articles. Cheap soap, perfumes, needles, brushes, bottles, cotton thread, window glass, and condensed milk are frequently seen in large towns, and appear to find a ready sale. The people are fond of doctoring themselves, and dealers in many kinds of patent medicines would probably find the Chinese excellent customers. The native farmers are fully alive to the necessity of renewing the productive powers of the soil, and an immense quantity of bean cake and other things is consumed for fertilising purposes. It is therefore not unlikely that a market might be found for cheap artificial manures. The increasing use of foreign nails has already been adverted to, and from this it is not unreasonable to infer that ploughshares, the iron parts of spades, rakes, axes, hammers, and tools of all kinds of native pattern might also meet with a demand. The study of foreign languages, which seems likely to be undertaken on a large scale, must also create a demand for foreign paper, ink, pens, note books, and such like things. I feel convinced, in spite of the opposite opinion entertained by many, that much might be done in opening up new branches of trade by men possessed of the necessary knowledge and qualifications who would deal direct with the Chinese, using at the same time native agents whose work they could personally direct and control. The requisite training would no doubt involve considerable expense, but in the end I am sure there would be an ample return."

Germany (Munich).—TRADE DEPRESSION.—In his annual report on Bavaria, His Majesty's Chargé d'Affaires at Munich, says that, after a long period of commercial prosperity, a reaction began towards the end of 1900 and increased during 1901. A crisis, starting with the Spielhagen Banks in Berlin, the bank at Leipzig, and other prominent banks, spread over the whole Empire. Commercial enterprise had been developing too quickly, and the war in South Africa and the complications in China have affected trade. The Elektrizitäts-Aktiengesellschaft, formerly Schuckert and Co., of Nürnberg, one of the largest electric works in Germany, have employed about 1,000 men less than in 1900. Their shares, quoted twelve months ago at 245, dropped to 95, and are now at 120, and they have paid no dividend in 1900-01, having paid 15 per cent. in 1898-99 and 1899-1900. On the Berlin Exchange between January 1, 1899, and October 19, 1901, electric shares have fallen 61 per cent., there having been a loss of £13,540,500 among 21 companies having a capital of £22,177,500, owing principally to too rapid enlargement of their works and over-production.

The strike in Bohemia occasioned a rise in the price of coal, and Bavarian industries have been affected by the increased foreign Customs tariffs. The depression was less felt in the Palatinate than in Bavaria proper. The Bavarian Factory Inspector's report for 1900, states that there were 102,182 industrial enterprises under inspection in 1899, employing 541,357 workmen; in 1900, 101,195 which employed 562,948 workmen. The report shows an increase of child labour, especially in the china and stone industries. In 1899, 7.7 per cent. of children being employed, and in 1901, 7.8 per cent. The number of factories as well as of mill hands has decreased in 1901. Factories and mills are under closer inspection in Bavaria than in any other German State. Females over 16 years generally work under 11 hours a day, and in 1901 even less owing to the trade depression; 10 hours is the general limit, and night work is avoided as much as possible.

Guatemala.—AGRICULTURAL MACHINERY.—A report has been drawn up by H.M. Consul at Guatemala on machinery made in and imported into Guatemala for agricultural purposes, from which the following extracts have been made:—

"It may first be broadly stated that the large majority of the machinery employed in Guatemala is that used in the coffee- and sugar-raising industries, and that while most of the coffee-cleaning plant is brought from England, that which is used on sugar plantations comes from the United States of America. The smaller implements come in about equal quantities from both countries. There are only one or two houses in Guatemala which manufacture machinery and agricultural implements. I have ascertained from them that the following are the articles which are made by them for use here:—Coffee-drying machines worked with hot air, live steam or exhaust steam, and of 20, 30, 60 or 90 quintal capacity. Coffee-pulpers, coffee-washing machinery, coffee-sorters or separators, coffee-peelers, elevators for coffee. Sugar-cane mills for steam and water power, iron sugar pans, sugar evaporating pans, Pelton wheels of all sizes, iron water wheels under and over shot, iron work for water wheels, turbine wheels, steam boilers (Heine's patent), tubular, up to 60 h.p., Coulliss engine up to 50 h.p., lift and force pumps, couplings and bearings and cast iron pulleys, single and double circular sawmills, and all kinds of casting of brass and iron.

"Although these local works no longer do the business they did in former years, they are still in a flourishing condition, and are largely employed for works of repair and in making smaller pieces of machinery."

As the result of enquiries made on a visit to one of the largest coffee and sugar plantations in the country, the Consul writes:—"The coffee-pulpers are made by and got from a London firm; the coffee-washers and the boilers are made by the same firm. The Pelton driving wheels have been brought from the United States, while the dynamo used for the electric lighting is of German manufacture. The coffee-dryers, of which there are two of 75 quintal capacity, are worked by the Guardoala hot-air system, and are made by the same London firm alluded to above. The machine known as the Trilla, for breaking and partially cleaning the coffee, is one of Anderson's patent, and was manufactured by a German firm. The separator (15 revolutions per minute) is by the same London firm. The sugar plant, which is very large, was got entirely from a Liverpool firm. The weighing apparatus has been supplied from the United States.

"I may add, merely to show the scale on which work is carried on upon this plantation (Concepcion), that it extends over 3,000 acres and produces annually from 10,000 to 12,000 quintals of coffee; 30,000 quintals of sugar; 100,000 litres of milk; 300,000 bottles of aguardiente, with some 2,000 head of cattle; while from 900 to 1,300 labourers are employed. All the machinery is of the newest and most improved kind, and no expense has been spared with regard to this branch. The plantation may be regarded as a sample of the large foreign-owned plantations of the country, of which there are many; and it may be taken for granted that most of the machinery used in these other plantations comes from the same sources."

After giving a long list of foreign machinery, and makers thereof, imported by German houses, the Consul remarks that the German houses are the largest importers of agricultural machinery in the country, owing, probably, to the fact that the large majority of foreign planters are Germans, who prefer to patronise their countrymen. As to what machinery may best be imported into Guatemala, it is extremely difficult to offer any opinion. The industry of the country consisting almost wholly in the raising of coffee and sugar crops, machinery employed in these industries seems to be that most certain of a sale, and the demand for such machines is very fixed in amount, as most of the plantations have already got all their plant and only require new pieces from time to time as the old machinery becomes worn, or when some new patent is discovered and issued which materially lessens the labour required or improves or increases the product. There is a constant demand for smaller agricultural implements, such as "machetes," knives, hoes, spades, etc.

The Consul concludes his report as follows:—"I may add that I have just been informed that there is a considerable demand for some improved form of plough. It appears that the ordinary plough imported from the United States or Europe is not very satisfactory. The soil here becomes baked to a hardness of steel, and the share or knife of the plough generally in use glances and slips on the earth's surface. What is wanted is a plough so shaped as to point its share deeper into the ground, so as to turn over a good furrow and not to slip on the top of the hard earth. From what I am told, I believe a considerable business might be done if ploughs were imported which realised these requirements."

Russia (Batoum).—In a report on the trade of Batoum and district for last year, H.M. Consul gives a comprehensive account of the mineral oil industry. He says:—"During the year 1901 a very marked decline in the prices of mineral oil in this country took place, and the depressed condition of the market, which was thereby brought about, especially at the places of its origin, was sorely felt by both producers and refiners; it eventually took effect in the shape of a crisis, which lasted practically throughout the whole of the second half of the year, and which has almost ruined a good many of those firms engaged in the petroleum industry of the Trans-Caucasus that

were not financially prepared to meet it. The larger and more wealthy firms also suffered very severely, but, as capital was at their backs, the crisis did not, apparently, render their position so precarious as was the case with their weaker and less fortunate colleagues in trade. The deplorable state of affairs that prevailed during the year in the oil trade of the Caucasus is attributable to over-production, which naturally resulted in the excessive accumulation of petroleum products at the sources of supply of the oil and the points of its shipment and export; some say, in a measure, also, to the insufficiency of the necessary rolling-stock on the Trans-Caucasian railway. On this head, however, I am inclined to differ, seeing that the tank-storage accommodation at Batoum was greatly in demand, and heavy stocks of oil were well maintained at this port throughout the year, every available space being fully occupied. This being so, it is clear that the Trans-Caucasian railway was quite able to meet the demand which was made on it for rolling-stock adapted for the transport of oil; besides which, the pipe-line between Mihailova and Batoum did not at any time during the year work up to its full capacity.

There is little doubt that the reason set forth above, namely, excessive production, contributed, in a great measure, towards bringing about the crisis in question, seeing that, as far as my information goes, during the whole of the period under review the petroleum trade of the United States of America, where there was no over-production, does not appear to have suffered in the least. In the United States prices were maintained throughout the year, and, in several instances, both crude and illuminating oils were sold at almost double the figures that were paid in the Caucasus for the same kind of oils. This over-production was principally brought about by the vast extent of new oil-bearing territory which the Russian Government, encouraged by the high prices of crude oils during the years 1898-99 and 1900, opened up. At the sales that followed for the lease of a considerable number of plots of oil lands, first at Bibi-Eibat, and subsequently in the oil-bearing territory adjacent to the Balakani fields, the bidding was very animated, and the then excited state of the markets accounts for the high prices that were offered and accepted for these lands.

As things now stand, the price of crude oil at the wells is about 1d. to 1½d. per 36 lb. avoirdupois weight, whereas some of the producers—and I am told that their number is by no means small—are compelled to pay the Government as much as from 1½d. to 1¾d. for 36 British lb., in addition to working expenses, amortisation, interest, and capital. A fairly accurate idea can be formed from the above of the heavy losses that are being sustained by those producers who are unable to, or have not, reduced their production. I am told, however, that a good many of them have found it more profitable to cease work completely. From the foregoing, it is evident that if this condition of affairs continues much longer, business at Batoum, and all other oil-producing centres of the Caucasus, is not in a satisfactory state. It is, therefore, with a view to improving this disastrous state of affairs that the group of persons who leased lands at the aforementioned high rates of royalty in June last again had recourse to the assistance and protection of the Government, which was approached with a request that the regulations now existing for levying royalties, in cash, might be modified in favour of the introduction of payment in kind, i.e., a percentage of the oil produced.

FOREIGN CONSULAR REPORTS.

Cement in Paraguay.—The American Consul at Asuncion reports that there is a steady demand for Portland cement, a single house selling 48,000 barrels per year. Most of the buildings are of brick, owing to climate and danger of insects in wooden structures. The price of the cement imported is from \$1.50 to \$1.70 gold, laid down at Buenos Ayres, whence it is shipped to Asuncion by river steamer. Some of the New York lines are understood to have arrangements for shipping to Asuncion at a rate as low as though a through bill of lading were obtained from New York. It is usually necessary, in dealing with traders in Paraguay, to extend six months' credit, as such terms are made by the various European houses at present engaged in this trade.

Demand for Lumber in China.—In a report to the State Department, Henry B. Miller, United States Consul at Niuchwang, China, declares that the future demand in China for Pacific coast lumber will be both extensive and permanent. For more than 1,000 miles up the valley of the Yangtze there is practically no timber in sight. In China more wood is used for coffins than for any other purpose. According to Consul Miller, from 8,000,000,000 to 10,000,000,000 feet of lumber are annually thus utilized. Very little lumber is used for house building. Mud and bricks, or mud and straw or millet stalks, are the materials mostly used. The roofs are made of either tiles or straw and mud. Next to coffins, the greatest use for lumber in China is for boats. Again, enormous quantities of wooden buckets and small wooden tubs are used in every district in China. Mr. Miller ventures the opinion that the material for the manufacture of such articles could be secured from the slabs that are now wasted in Oregon and Washington saw mills. Consul Miller says he has only been able to locate two saw mills in all China, one near Fuchau, of small capacity, and another at Niuchwang. The mill at the latter place was imported from Michigan, and though it is but a small single circular saw mill, capable of cutting about 2,000 feet of lumber a day, it seems to meet the requirements. Such mills could be used to advantage at Tientsin, Shanghai, Hankow, and other places.

Production and Consumption of Coffee.—The French Consul in Brazil, in a report on the state of trade in that country, states that there is an over-production of coffee throughout the world, and that in Brazil there is a tendency to restrict the area of cultivation. He says that in the year from July 1, 1900, to June 30, 1901, the total production of coffee throughout the world was 15,460,000 bags of 132 lb. each, and that of this quantity 11,500,000 bags were grown in Brazil, 1,150,000 in Guatemala, Costa Rica, Mexico, and Nicaragua, 1,050,000 in Venezuela, Colombia, Ecuador, and Peru; 480,000 in the Dutch Indies, 450,000 in Hayti, 315,000 in British India and Ceylon, 200,000 in Puerto Rico and Jamaica, and 90,000 in Padang. He estimates the consumption at 14,117,620 bags, leaving an excess of production at 1,342,380 bags.

Transport in Madagascar.—The United States Consul at Tamatave, in a report upon roads and transport systems in Madagascar, says that hitherto goods have been transported on men's shoulders, one man carrying from 60 to 80 lb. The first tentative departure from the old methods was a convoy of three American wagons, each carrying about 12 cwt. (i.e., about 15 men's loads), and drawn by four oxen, the journey occupying 13 days from Mahatsara to Tananarivo, a distance, as mentioned, of 150 miles. Several small enterprises have followed, such as mule carts, ox carts, and hand trucks, but nothing has yet been established on a large scale. Passengers have now adopted the two-wheeled hand truck, called a "pousse-pousse." Three men are employed for one vehicle carrying one person. The vehicle of the future, is, probably, the motor wagon.

CHAMBERS OF COMMERCE REPORTS.

UNITED KINGDOM.

Bristol.—The first Council meeting of the Bristol Chamber of Commerce since the annual meeting was held on the 30th April, at the offices of the Chamber, at which Mr. John Mardon was elected president for the current year. The president stated that an invitation had been received by the Chamber to take part in the Congress to be held at Dusseldorf from 29th June to 5th July next. The invitation was extended by the city of Dusseldorf and approved and seconded by the Imperial Chancellor in the name of the German Empire, and the meeting is to be under the auspices of the German Crown Prince. Attention was called to the fact that Dusseldorf, although 155 miles distant from Rotterdam, was yet considered a port, and this was evidence of the way in which internal navigation received attention upon the Continent. The invitation was referred to the Railways and Canals Committee.

Liverpool.—At the annual general meeting of the African Section, Sir Alfred L. Jones presided, and, in moving the adoption of the report, said that the first item dealt with was the health and sanitation of West Africa, and the proposed commission to that country. Liverpool might well be proud of the efforts put forward to improve the health of West Africa. The climate was one of the great terrors to the commerce and the lives of the people out there, and he thought they ought to gratefully acknowledge the help given to them by Mr. Chamberlain and the Colonial Office, and the help which had been extended by the West African Governors to the expeditions they had sent out. It was a matter for very great gratification that the authorities had recognised what Liverpool was trying to do, and that they had made Professor Boyce a Fellow of the Royal Society. As regarded the commission it was proposed to send out, a decision had not yet been come to as to how they could carry that matter forward. They would be obliged to send out men of position in trade, and it was not an easy thing to get men to leave their business for three or four months, or perhaps longer. He wished to acknowledge the very great assistance received from many people. Several leading men had given very handsome sums, and the money had been well laid out in the endeavour to improve the sanitation of the country.

As regarded the West African cable rates, they had got some arrangement, and they hoped to get some still further reduction in the cost of cabling, as this was an important item in a man's business. The affairs of Sierra Leone were going on fairly well, and they were promised, owing to the agitation of Liverpool merchants, that they were to have a mountain railway to take people on to the hills to live instead of living in the towns. As to Liberia, things there had not been so satisfactory. The labour concessions sold to the Germans seemed to be practically like going back to the days of slavery. The labour market in West Africa should be absolutely free, so that a man could go from one colony to another if he wished. The affairs of the Gold Coast had troubled them a good deal during the year, particularly in regard to the number of concessions which had been granted. However, they hoped with a little pressure to enable the Gold Coast companies to get through their concessions.

Considerable progress was being made with the railways. It was entirely due to Liverpool that these railways on the west coast had been made. The railway from Lagos to Tarkwa had been completed, and the Coomassie railway would be finished in about twelve or eighteen months. Speaking about Dahomey, he said, unfortunately, the French were not so imbued with the desire to be free traders as they were, and did not throw the country open, in their opinion, in a fair way for the native. All Europeans must realise, if Africa was to be any good to them, it must first of all be made good to the native. Europeans could not work or reside very well in Africa, and therefore he would commend it very strongly to their own country, as well as to France, Germany, and Portugal, to make the position of the native in every way as comfortable and prosperous as they could. In Lagos, the Chamber of Commerce had worked for a great many years to do away with the transit duties as between Lagos and Porto Novo, and he was glad to say they had done away with that tax. He referred to the port of Lagos being very awkward to deal with, and to deepen the bar it would cost a million of money. Speaking of Nigeria, he said a tariff rate had been offered, but he did not think that so far much advantage had been taken of it. In alluding to the French Congo, he said he was delighted to introduce to them M. Emile Bailland (Director of the Agricultural and Industrial Society of French Guinea), who had arrived that day from West Africa. In conclusion, he said, personally, he was distinctly opposed to any kind of monopoly being given for any tracts of land in West Africa, either by charter or by combine. He felt the deepest sympathy with the old firms who had settled in the country, and who were now harassed by the authorities, and practically driven out.

M. Emile Bailland said that the French Government granted concessions to the people of West Africa because the British Government had supported three chartered companies there. He thought it was a very bad thing for any nation to make concessions in West Africa. He spoke in favour of low tariffs, and argued that these should be controlled by the Government, and not by private persons. Railways also in West Africa must be managed by the Government, and the freights must be made as low as possible.

Sir A. L. Jones said that he would like to place before all Frenchmen, Germans, and Americans the fact that in West Africa they had equal rights with Englishmen, where England could prevent that equality if they wished. They could share in the trade facilities that England had to pay for. He was not going to complain of that, but he thought that these countries ought to keep the fact in mind, for if they intended to maintain protection with regard to their own colonies and commodities it might be worse for them. If Africa, especially West Africa, was to make progress the native must be made prosperous and to feel happy at home. He wanted to see West Africa develop in every possible direction. He thought that cotton could be produced there as good and as cheap as in America. Experiments had already been made in cotton-growing, and assistance had been given to the venture by the Government. The experimenters had also had the sympathy of merchants in Oldham and Manchester. A most encouraging meeting had been held at the latter place, and a society had been formed for the purpose called the British Cotton Growing Association. West African shipowners had promised to carry over to this country the first batches of West African cotton free of charge. Sir Alfred said they were exceedingly anxious to work agreeably with Bishop Tugwell and his friends. They hoped the missionaries would do something to teach the native every possible kind of industry, to enable him to make a living on this earth as well as help him with regard to the next world.

Presiding on the 9th ult. at the annual general meeting of the iron and general metal trades section of the Liverpool Chamber of Commerce, Mr. C. R. Anderson drew attention to the news in that morning's papers in regard to the shipping combination, and said that the rapid transition through which British trade in general, and the iron and metal trade in particular, was passing, caused much uneasiness. With crude iron and steel crossing the Atlantic from west to east one year and from

east to west the next, and yet another year, as at present, moving to some extent both ways simultaneously, they had a feature to deal with that defied correct calculations or forecast for any lengthened period. For many years the Board of Trade had been armed with restrictive powers, which were now, under the pressure of foreign competition free from such restrictions, proving to be a veritable old man of the sea round the neck of trade, making British railways and British steamers the most expensive to work in the world. Britons built up their trade independently of State aid, but they were face to face with competitors whose resources equalled and sometimes exceeded their own, and whose trade had been founded and established on other lines and under Governmental aid and protection. With the entire control of a system of United States railways and British steamships passing into the hands of a gigantic American trust, apparently ruled by one man, it was not difficult to imagine a control of our food supplies from the United States. The mere thought of such a position being possible should urge them to devise methods whereby they could rely in case of need entirely upon the colonies.

Manchester.—Mr. John Thomson presided at a quarterly meeting of this Chamber on the 7th ult., and said that the state of the cotton industry was not encouraging. For some weeks 15,000,000 spindles employed in spinning yarn from American cotton for the Manchester market had been working short time, stopping for a day and an hour in the week, and it appeared likely that the reduction might continue. Manufacturers had no longer the predominant influence in the cotton market which they once had. The production of yarn and cloth in foreign countries was now so large that the Lancashire consumption was only one factor among others. If the prospects of the next season's crops in the United States should continue favourable there might be some decline in the price of cotton, which would give spinners and manufacturers a better margin. Mr. Burgess moved: "That this Chamber is of opinion that the terms of the convention agreed to at the Sugar Conference in Brussels will deprive Great Britain of her freedom of action in the exercise of her fiscal rights, that the advantages (so called) of the convention as pertaining to the industrial interests of the United Kingdom and British colonies are illusory, and this Chamber strongly urges Parliament not to ratify the convention." The resolution was carried by 19 to 13. The president, in reply to a representation by Mr. Fogg that the directors of the Chamber should have taken more vigorous action against the proposed corn duties, said the board had offered more decided opposition than had been expressed on the part of any other Chamber of Commerce in the Kingdom. They had passed a resolution disapproving of a measure for the benefit of the corn growers and landowners of the country at the expense of the population at large. The Chamber, however, could not engage in party political agitation.

GENERAL INTELLIGENCE OF THE PAST MONTH.

May, 1902.

UNITED KINGDOM.

May 1st: The King returned to Buckingham-palace from Newmarket, and, accompanied by the Queen and Princess Victoria, visited the Royal Academy. The Duke and Duchess of Connaught opened the Exhibition at Wolverhampton. The Cork International Exhibition was opened by Lord Bandon. Mr. J. Bell, Town-clerk of Leicester, was elected Town-clerk of the City of London.

2nd: The King and Queen held a Court at Buckingham-palace. Lord Goschen presided at the annual meeting of the Royal Literary Fund. Death of Major-General J. Castle.

3rd: The Prince and Princess of Wales were present at the annual festival of the Juvenile Branch of the Church of England Temperance Society. The Royal Academy Banquet took place. Viscount Wolseley, Dr. Jameson, and Mr. R. Kipling arrived at Southampton from the Cape.

5th: In the House of Commons the new procedure rules came into operation. Princess Christian distributed prizes at the annual meeting of the Ragged School Union. The British and Foreign Sailors' Society held their annual meeting at the Mansion-house.

6th: The Primrose League held its annual meeting, Lord Howe, the Chancellor, presiding. The Church Missionary Society held its anniversary meeting. Death of the Rt. Hon. Lord Robert Montagu.

7th: Lord Salisbury addressed the annual demonstration of the Primrose League at the Albert-hall. The annual meeting of the Women's Liberal Association took place. The Iron and Steel Institute opened its annual meeting.

9th: The Prince of Wales was installed as Chancellor of the University of Wales. The annual meeting of the British and Foreign School Society was held. The Women's Liberal Unionist Association held their annual meeting.

10th: The Prince and Princess of Wales visited Dinorwic Slate quarries at Llanberis. Princess Henry of Battenberg laid the foundation-stone of the new Royal Caledonian Asylum. Princess Christian opened the Victoria Recreation Ground at Finchley. Mr. G. Toulmin (L.), was elected M.P. for Bury. Death of General Sir C. L. Barnard, Col.-Commandant, R.M.A.

11th: A "Bread Tax" demonstration took place in Hyde Park.

12th: The King held a levée and investiture at St. James's-palace. The Prince of Wales opened the new Alexandra Hospital at Rhyl. The Chancellor of the Exchequer announced the withdrawal of the proposed cheque-tax.

13th: The Prince of Wales, as Master of Trinity-house, was entertained at luncheon at the Mansion-house. The National Liberal Federation opened its annual meeting at Bristol. Princess Henry of Battenberg unveiled a memorial window to Queen Victoria in Hereford Cathedral.

14th: The Queen visited the Exhibition of Gifts and Addresses presented to the Prince and Princess of Wales during their Colonial Tour. Lord Rosebery, the newly-elected Chancellor, presided on Presentation Day at the London University. Mr. Andrew Carnegie was presented with the freedom of the Plumbers' Company. The Navy League held its annual meeting. In the House of Commons, the Finance and Loan Bills were read a second time.

15th: Lord Rosebery was presented with the freedom of the borough of Colchester. Death of the Rev. Father Dolling. The Exhibition of Gifts and Addresses presented to the Prince and Princess of Wales was opened at the Imperial Institute.

16th: The King and Queen held a Court at Buckingham-palace. The Prince of Wales opened the new drill-hall of the King's Colonials. Mr. Chamberlain addressed a meeting of the Birmingham Liberal Unionist Association.

17th: The King and Queen left Buckingham-palace for Windsor Castle. Prince Henry of Prussia arrived in Dublin. Death of Mr. Braxton Hicks. The United Irish League of Great Britain held its annual meeting at Manchester.

19th: The Co-operative Union opened their annual congress at Exeter. Mr. Lionel Carden was appointed British Minister Resident at Havana.

20th: Death of Sir Arthur Arnold. The Peace Society held its annual meeting in London. The Church of Scotland opened its General Assembly in Edinburgh. Death of Sir John Irvine Murray.

21st: The Mansion-house Fund for the relief of the distress at St. Vincent amounted to £32,000. The Bishop of London presided at the annual meeting of the Church Missions to Seamen.

22nd: The King and Queen, and Princess Victoria, visited the Royal Military Tournament at Islington. The Royal Agricultural Society held its annual meeting. Sir J. Crichton Browne addressed the annual meeting of the Association of Asylum Workers.

23rd: The Mansion-house Fund for the relief of the distress of St. Vincent amounted to £41,000. Lord Rosebery was entertained at dinner by the National Liberal Club.

24th: Princess Christian distributed certificates awarded by the National Health Society at Grosvenor-house. Sir H. Campbell Bannerman addressed a Liberal meeting at Darlington. Sir H. Burdett issued an appeal on behalf of King Edward's Hospital Fund.

26th: The Duke of Marlborough was appointed a K.G. in the room of the late Earl of Kimberley. The birthday of the Princess of Wales was celebrated. Death of Rear-Admiral E. G. Hamilton Earle. The Prince of Wales was re-elected Master of Trinity-house Corporation. The Royal Geographical Society held their annual meeting. Sir H. Irving presided at the annual meeting of the Actors' Orphanage Fund.

27th: The Bath and West of England Agricultural Show was opened at Plymouth. The General Medical Council opened its session. The London Diocesan Conference was opened in the Church-house, Westminster. Death of Mr. F. B. G. Jenkinson, C.B.

28th: The King and Queen visited the Royal Horticultural Society's show. The Prince and Princess of Wales were present at the Royal Military Tournament. The Church Committee for Church Defence and Church Instruction held their annual meeting. The National Rifle Association held their spring meeting. The annual meeting of the City and Guilds of London Institute was held. Death of Lord Chichester.

29th: The King received King Lewanika, paramount chief of Barotseland, at Buckingham-palace. Tsai Cheng, the Chinese Special Envoy to the Coronation, landed at Dover. Prince Christian laid the foundation-stone of the new municipal buildings at Walsall.

30th: His Majesty's birthday was celebrated. The King presented colours to the Irish Guards on the Horse Guards Parade.

COLONIES.

Australia.—2nd: The Bill for increasing the salary of the Governor-General to £8,000 yearly was rejected, but the House of Representatives granted £10,000 towards the expenses of the Royal visit.—3rd: The retirement of Sir George Turner, Commonwealth Treasurer, at the end of the present Parliament, was announced.—14th: Lord Hopetoun resigned the Governor-Generalship.—21st: The Senate passed a resolution of congratulation to the King on his coronation. **New South Wales.**—3rd: The death of Judge Dowling was announced. 27th: Sir Harry Rawson landed at Sydney, and was received by Mr. See, the Premier. **Victoria.**—1st: The Ministry resigned.—5th: Mr. Peacock, the Premier, declined to accept the resignation of the Ministers.—11th: Mr. Peacock announced that a Government Bill would be introduced to reduce the Legislative Assembly to 60 members, and the Legislative Council to 30 members; the number of Ministers to be limited to six; adult suffrage will also be introduced.—15th: A conference of State Premiers was held at Melbourne with regard to Lord Hopetoun's resignation.—27th: Parliament was opened.

South Australia.—5th: The general election left the strength of parties unchanged, except that the Labour Party lost three seats. **British West Africa.**—15th: It was announced that a permanent British garrison would be stationed at Lake Tchad. **Canada.**—2nd: The Government proposed to exclude foreign-built British ships from the coasting trade of Canada, unless licensed by the Minister of Customs.—8th: The contingent for South Africa left Halifax.—10th: Death of Dr. Monro Grant, Death of the Hon. F. G. M. Dechéne, Commissioner of Agriculture for Quebec province.—14th: Parliament voted \$50,000 for the relief of the sufferers in Martinique and St. Vincent. 24th: Victoria Day was observed throughout the Dominion.

Cape Colony.—5th: Lord Milner left Cape Town for Johannesburg. The Treason Court at Aliwal North sentenced David de Wet to pay a fine of £500, and his brother Pieter a fine of £1,000.—7th: News was received of the relief of Ookiep by Col. Collwell.—16th: General Ian Hamilton made a successful drive of Boers in Bechuanaland, capturing 400.—24th: The anniversary of Queen Victoria's birthday was celebrated.—27th: Commandant Malan was mortally wounded and captured at Ripon Road.—28th: Mr. Seddon left Cape Town.

Malta.—29th: Mr. E. M. Merewether was appointed Lieutenant-Governor and Chief Secretary.

Natal.—1st: The House of Assembly approved the enlargement of the Natal territory.—12th: The House of Assembly passed the Annexation Bill.—13th: The Parliament was prorogued till September 25.—15th: The Premier, Sir A. Hime, left for London, to attend the coronation.—17th: Mr. Seddon, the Premier of New Zealand, arrived at Durban.

Somaliland.—3rd: Lieut.-Col. Swayne was reported to have made a successful raid on the Eastern Somali tribes, and captured a quantity of stock.

St. Vincent.—7th: The volcano, La Soufrière, was reported to be showing signs of eruption.—10th: A disastrous volcanic eruption of La Soufrière took place with the loss of 1,600 lives.—15th: The King contributed £400 to the Mansion-house Fund for the relief of the sufferers.—18th: Another eruption of La Soufrière took place.

Orange River.—3rd: Lord Blackwood was appointed Acting Secretary to the Administration during Mr. Wilson's absence.—7th: Lord Kitchener reported the capture of 321 Boers in a drive in the north of the colony.

Transvaal.—1st: It was announced that the Boer leaders would re-assemble at Vereeniging to discuss the terms of peace.—12th: Most of the refugees returned to Johannesburg, and more mines were re-opened on the Rand. 14th: The banishment of 30 more Boer leaders, including ex-Judge de Kock, was announced.—15th: The Peace Conference of the Boer leaders at Vereeniging was opened.—18th: The delegates chosen by the Peace Conference arrived at Pretoria.—21st: Lord Milner arrived at Pretoria. Mr. Seddon arrived at Johannesburg.—26th: Further surrenders of Boers were reported: 29th: It was announced that the Boer delegates had decided to accept the terms of peace.

INDIA.

1st: A disastrous tornado occurred in the Dacca district of Bengal.—2nd: The Government instituted a civil division of the Order of Merit for natives of India performing some special act of gallantry.—4th: The total number of persons on famine relief was 401,000.—9th: The Thebaw Sawba, a prominent Shan Chieftain, died in Mandalay.—19th: A disastrous hurricane occurred in Sind.—23rd: In the Council, Mr. Finlay, Secretary of the Financial Department, introduced a Sugar Bill.

FOREIGN COUNTRIES.

Argentine Republic.—2nd: The Government cancelled the concession for a commercial harbour at Bahia.—9th: Congress was opened.—24th: An agreement was concluded with Chili for the limitation of the armaments of each country. King Edward VII. was made general arbitrator between the two countries.

Austria-Hungary.—7th: The Emperor-King received the Delegations at Buda-Pesth. Count Goluchowski announced the approaching renewal of the triple alliance.

Belgium.—7th: The Chamber voted a grant of 7,000,000 f. to Ostend and Spa, as an indemnity on account of the Anti-Gambling Bill.—25th: The elections for the renewal of one-half of the Chamber of Deputies took place, and resulted in favour of the Catholics.

Brazil.—2nd: The Congress was opened.

Chili.—7th: A new Cabinet was formed with Señor Barros Luco as Premier and Minister of the Interior.

China.—3rd: Disturbances took place on the Shangtung border.—9th: The rebels bombarded Nanning-fu.—11th: The agreement with England for the restoration of the Peking-Shanghai-Kwan railway to the Chinese Civil Administration was notified to the Powers.—12th: The Government decided on the immediate reduction of the export duty on tea to 5 per cent. A defeat of the rebels was reported.—24th: Belgium withdrew objection to the railway agreement with Great Britain, provided she was granted a concession at Hankau.

Corea.—4th: The first sod of the Seoul-Songdo section of the Seoul-Wi-ju railway was cut.

Crete.—28th: Another Mycenaean palace was discovered in the neighbourhood of Phæstos.

Cuba.—16th: President Palma selected a Cabinet.—20th: Congress met and proclaimed the Constitution.

Denmark.—17th: The Landsting rejected the treaty for the sale of the Danish West Indies to the United States.—25th: President Loubet visited Copenhagen, and was entertained at luncheon by King Christian at the Amalienborg Palace.

Egypt.—10th: An agricultural bank was established, with a capital of £2,500,000, for making advances to the fellaheen.

France.—8th: A new air-ship was constructed by M. Severo, a Brazilian.—9th: The great fraud of M. and Mme. Humbert was discovered.—12th: The results of the Second Ballots in the General Election showed a ministerial majority of 80 to 90.—12th: M. Severo's air-ship exploded, and the inventor and his companion were killed. King Edward sent 25,000 f. to the Paris relief committee for the sufferers in Martinique.—13th: President Loubet left Paris for Brest, on his journey to Russia.—16th: M. Waldeck-Rousseau announced his approaching retirement.—26th: Death of M. Benjamin Constant.—27th: M. Loubet arrived at Dunkirk.

Germany.—1st: The Crown Prince opened an Art and Industrial Exhibition at Dusseldorf.—2nd: Death of Prince George of Prussia.—6th: The Budget Committee of the Reichstag adopted the arrangements for the construction of a railway from Dar-es-Salaam to Mrogora, in German East Africa.—7th: The Berlin Merchants' Guild complained of a loss of trade in consequence of the anti-British feeling in the German press.—11th: The Emperor intimated the repeal of the "dictatorship paragraph" relating to Alsace-Lorraine.—12th: A large public meeting in Berlin protested against the Tariff Bill.—27th: Count von Bülow introduced a Bill in the Prussian Diet appropriating 250,000,000 marks (£12,500,000) for the expropriation of Polish proprietors in East Prussia.

Haiti.—9th: General Sam, the President, resigned.—12th: Congress assembled to elect a President.—27th: A Provisional Government was formed, with General Boisronnd Canal as President, and M. Alexis Nord as Minister of War.

Holland.—1st: The Queen was reported to be recovering from her illness.—3rd: The Queen's condition became seriously worse.—7th: The Queen was reported to be out of danger.—9th: The Queen was able to sign decrees.—18th: The Third Anniversary of the Hague Conference was celebrated.

Italy.—14th: General Ottolenghi was appointed Minister of War.

Martinique.—5th: St. Pierre was completely destroyed by a volcanic eruption of Mt. Pelée; 30,000 persons were killed.—20th: Further eruptions of Mt. Pelée took place.—22nd: The United States warship *Dixie* arrived at Fort de France with supplies.

Philippines.—3rd: General Davis reported the capture of the principal fort in Mindanao.

Russia.—9th: Disturbances were reported among the peasants in the Moscow district and southern province.—13th: The Council of State signified its approval of a law freeing the village communes from their joint responsibility for the taxes of their members.—16th: The assassin of M. Sipiaguine was hanged in St. Petersburg.—18th: An attempt was made to assassinate Lt.-Gen. de Wahl, Governor of Vilna.—21st: A grand review was held at Krasnoe Selo in honour of M. Loubet's visit.—22nd: M. Loubet arrived in St. Petersburg.—23rd: President Loubet left Cronstadt for Denmark.

Santo Domingo.—2nd: The revolutionists had possession of the island except the capital and Puerto Plata.—7th: President Jimenez resigned his claims to the Presidency, which was assumed by Señor Vasquez, the Vice-President, who annulled the adherents of the late Government.

Servia.—18th: The King accepted the resignation of the Ministry.—19th: M. Pasitch failed to form a new Ministry.

Spain.—17th: The enthronement of King Alfonso XIII. took place in Madrid. The Duke of Connaught represented King Edward at the ceremony.—19th: The fêtes at Madrid were continued and the King held a review of the troops.—21st: The King was present at a bull-fight in Madrid.—22nd: The Duke of Connaught and suite left Madrid.—28th: Señor Canalejas, Minister of Agriculture, resigned.

Turkey.—20th: An Iradé was issued for the delivery of the *bérat* to Mgr. Firmilian, the Servian Bishop of Uskub.

United States.—5th: Death of Bret Harte.—6th: Death of Admiral Sampson. Death of Dr. Corrigan, Roman Catholic Archbishop of New York.—9th: A Bill admitting Arizona, New Mexico, and Oklahoma to the rank of States passed the House of Representatives.—12th: The Senate voted \$200,000 for the relief of the Martinique sufferers.—14th: Mr. Lewis Nixon resigned the leadership of Tammany Hall.—21st: President Roosevelt attended the centennial of the Presbyterian Home Mission. A temporary injunction was granted to Chicago against the Beef Trust.—24th: Death of Lord Pauncefoot, British Ambassador at Washington. A statue of Marshal Rochambeau was unveiled at Washington.

FORTHCOMING EVENTS.

UNITED KINGDOM.

London.—On the 2nd the KING will hold a LEVÉE at St. James's Palace. On the same date Mr. Hanbury will receive a deputation on "milk-blended" butter.—June 3, PRINCE OF WALES' birthday.—On the 5th a concert will be held at Grosvenor House in aid of the Antarctic Ship Relief Fund.—On the 6th inst. at the Royal Institution, Sir Benjamin Baker will lecture on "The Nile Reservoir and Dams."—On the 10th the dinner of the LONDON CHAMBER OF COMMERCE, the INDIAN POLITICAL SERVICE banquet, and the EAST INDIAN RAILWAY dinner will be held.—On the 19th Sir Antony P. MacDonnell will preside at the annual BURMA DINNER.—On the 20th Lord Windsor will preside at the Complimentary Banquet to the IMPERIAL SOUTH AFRICAN LEAGUE.—On the 23rd the WEST AUSTRALIAN CORONATION BANQUET will be held.—On the 26th the CORONATION OF THEIR MAJESTIES KING EDWARD VII. and QUEEN ALEXANDRA will take place in Westminster Abbey.—On the 27th will be the ROYAL PROGRESS of their Majesties through London.—The 28th will be the Coronation REVIEW OF THE FLEET at Spithead.—On the 2nd July the Annual ASSAM BANQUET will be held.

Reading.—The annual conference of the BRITISH DAIRY FARMERS' ASSOCIATION will open on the 2nd inst.

Richmond (Surrey).—The ROYAL HORSE SHOW will be held on the 14th.

FOREIGN COUNTRIES.

Germany (Mannheim).—An Agricultural Exhibition is to be held at Mannheim from June 5 to 10 under the auspices of the German Agricultural Society. The exhibition will not be of an international character, but it promises to be of interest as showing the progress realised by agriculture in South-west Germany, especially as regards horse-breeding and cattle-rearing.

Switzerland (Lucerne).—INTERNATIONAL MUSEUM OF WAR AND PEACE.—The Executive Council of this museum, which is shortly to be opened at Lucerne, announce that the inauguration ceremony will take place on June 7. (Zurich).—On the 1st inst. the INTERNATIONAL TEXTILE FACTORY WORKERS' CONGRESS will open and continue for six days.

United States (St. Louis).—The date of the opening of the Exhibition at St. Louis has been postponed to the 1st May, 1904.

NAVAL AND MILITARY INTELLIGENCE.

NAVAL.

The *Amphitrite*, cruiser, Captain C. Windham, left Malta on the 18th ult. for China.

Prince Alexander of Battenberg joined the *Britannia* at Dartmouth yesterday as a naval cadet.

The *Skate*, torpedo-boat-destroyer, was paid off into the A Division of the Devonport Fleet Reserve on the 20th ult.

The *Endymion*, cruiser, Captain A. W. Paget, has been ordered home from the China station as soon as is convenient, to pay off.

The *Cyclops*, coast defence ship, has been transferred to the E Division of the Dockyard Reserve at Sheerness as unfit for further service.

The Travers pension of £75 a year, vacant by the death of Commander J. P. Cheyne, has been awarded to Commander H. E. C. Robinson.

A naval pension of £100 a year has been awarded to Vice-Admiral T. Harvey Royse, being an additional pension for officers of that rank.

A Travers pension of £75 a year, being an additional pension from April 1 last, has been awarded to Commander C. S. Shuckborough.

The appointment of Admiral Sir C. E. Donville to succeed Admiral Sir J. A. Fisher as Commander-in-Chief in the Mediterranean is notified.

Rear-Admiral Sir Baldwin W. Walker has been appointed Rear-Admiral for the Cruiser Division of the Mediterranean Fleet, to date May 7.

It is understood that Rear-Admiral William H. Henderson will succeed Vice-Admiral Sir Thomas Jackson as Superintendent of Devonport Dockyard.

The fourth of the British Submarine-boat Flotilla was successfully launched from the yard of Vickers, Sons and Maxim, Barrow, on the 23rd ult.

Rear-Admiral C. C. Drury has been appointed to succeed Rear-Admiral D. H. Bosanquet as Commander-in-Chief on the East Indies Station, to date June 5.

On the 4th inst. Rear-Admiral Sir W. Acland will be relieved as second in command of the Channel Squadron by Rear-Admiral the Hon. A. Curzon-Howe.

Rear-Admiral G. L. Atkinson-Willes has been appointed to succeed Rear-Admiral Sir Baldwin W. Walker as second in command of the Home Squadron, to date May 7.

Vice-Admiral A. L. Douglas has been appointed to succeed Vice-Admiral Sir F. G. D. Bedford as Commander-in-Chief on the North American and West Indies Stations, to date June 10.

The *Icarus*, sloop, Commander G. F. S. Knowling, arrived at Devonport on the 10th ult., from the Pacific Station, where she has been relieved by the *Shearwater*, Commander C. H. Umfreville.

The *London*, battleship, is to be commissioned at Portsmouth on the 7th inst., and after the naval review she is to be sent to the Mediterranean to relieve the *Royal Sovereign*, battleship, Captain F. S. Ingfield.

The launching of the cruiser *Encounter*, at Devonport on June 18, will be followed shortly afterwards by the floating of the cruiser *Challenger* at Chatham. The *Encounter* was commenced on January 28, 1901, and the *Challenger* on December 8, 1900.

The *Arrogant*, cruiser, Captain H. C. B. Hulbert, will be paid off into the A Division of the Devonport Fleet Reserve on June 3, and the *Doris*, cruiser, will be commissioned on the following Saturday with the officers and crew of the *Arrogant* to take her place in the Channel Squadron.

The preparations for laying down the four British cruisers placed with Clyde builders, have been temporarily stopped, as the Admiralty has decided to lengthen the vessels so as to allow greater thickness of the armour protection. The change is made in consequence of a newly invented forged steel cap for armour-piercing shells.

Orders have been given that all the Naval, Gunnery, and Torpedo Schools at Portsmouth are to close during the month of July, as important naval operations are to be carried out on the south-west coasts of England and Ireland. In these the Channel, Home (Reserve), and Cruiser Squadrons will take part, leaving Spithead on July 2.

The 30-knot destroyer *Cynthia*, which recently had a thorough refit at Sheerness, was commissioned at Chatham on the 14th ult. for the Mediterranean Station, to replace the 27-knot destroyer *Skate*. The *Cynthia* will shortly leave for Malta in company with the 32-knot destroyer *Albatross* and the 30-knot destroyer *Mallard*, both of which are under orders

to join the Mediterranean Flotilla, replacing the older and slower destroyers *Hardy* and *Sunfish*, which are to return to England for instructional duties. When these changes have taken place very few 27-knot destroyers will be left in the Mediterranean.

In the Nielauss boiler trials of the *Seagull*, torpedo-gunboat, and at her first eight-hours' trial at 1,000 i.h.p., when the actual mean power was 1,029 and the coal consumption worked out at 2'28 lb. per unit of power per hour, the make-up feed water necessary to replace wastage was '32 lb. (not 32 lb.) per unit of power per hour. When she ran for eight hours at nominally 3,000, but actually at 2,804 i.h.p., and the coal consumption was 2'15 lb. per unit of power per hour, the make-up feed water required was '67 lb. (not 67 lb.). The coal consumption during the part of the third run worked out at 2'14 lb. per unit of power per hour and the make-up feed water required was 35 lb. (not 35 lb.).

The armoured cruiser *Levathan* has finished her trials, and has proved herself the fastest cruiser in the Royal Navy. On her eight hours' full-power trials she made 23'23 knots per hour, and her indicated horse-power was 31,203. Her coal consumption worked out at 1'94 lb. per unit of power per hour. The contract speed of the *Drake* class is 23 knots, and contract power 30,000. The *Good Hope*, the first to run her trials in March last, made 23'05 knots, and her indicated horse-power was 31,071. The two remaining cruisers of this class, the *Drake* and the *King Alfred*, are building, the former at Chatham Dockyard, the latter at the Naval Construction Works of Messrs. Vickers, Sons, and Maxim at Barrow-in-Furness.

The Belleville water-tube boilers having been condemned by the Boilers Committee for the purposes of the Navy, the Board of Admiralty, it is understood, have decided on an admixture of boilers in all the large new vessels. A certain proportion of cylindrical boilers will be fitted with a larger number of water-tube boilers. The idea that has prompted this decision is, no doubt, that, while the cylindrical boilers may be used largely for ordinary cruising purposes, the water-tube boilers will give that great rapidity in raising steam in emergencies which is their special recommendation. What type of water-tube boiler will be used has not yet been decided, the Admiralty being engaged in experiments with a number of patterns.

The *Gossamer*, torpedo-gunboat, which has been fitted with new engines and the Reed type of water-tube boilers by the Palmer Shipbuilding and Engineering Company, of Jarrow-on-Tyne, has been taken into the steam basin at Sheerness Dockyard to complete for sea after successfully carrying out her programme of steam trials. Particulars of full-power trial:—Pressure of steam in boilers, 230 lb.; ditto at engines, 215 lb.; air pressure, 2'7 in.; vacuum—starboard, 25'9 in.; port, 25'2 in.; revolutions—starboard, 371'8; port, 371'9 per minute; i.h.p.—starboard, high, 849; intermediate, 1,166; low, 1,038—total 3,053; port—high, 840; intermediate, 1,072; low, 1,093—total, 3,005; total starboard and port, 6,058; speed, 20'32 knots. The old engines of the *Gossamer* were of 3,500 horse-power, and her full speed was 19 knots.

Experiments with oil fuel are to be made on an extensive scale with a few of our battleships. The *Mars* is to have two of her large cylindrical boilers fitted for the purpose of burning oil fuel exclusively; two other of her boilers are also to be fitted to enable them to burn oil fuel in conjunction with coal; and tests are also to be carried out on board the *Hannibal*. Other tests are to be made at Keyham Dockyard with some water-tube boilers belonging to the cruiser *Blonde*, but these boilers are to be erected on shore in the dockyard. The cruiser *Arrogant* is to have similar experiments with the Belleville type of boiler, and furnaces are also to be erected at Portsmouth for carrying out tests with liquid fuel. One advantage of using liquid fuel will be that it will further economy in coal consumption; but in war time it may not be possible to import oil, or to obtain it on foreign stations in sufficient quantities for the furnaces of our warships; this must always be an important objection to fitting naval boilers to burn oil fuel only.

The Admiralty have decided on the following types of boilers for the six first-class cruisers of the 1901-2 programme, now under construction:—

The *Devonshire* (Chatham Dockyard).—A combination of 4-5ths Nielauss and 1-5th cylindrical boilers;

The *Hampshire* (Sir W. G. Armstrong, Whitworth, and Co.).—A combination of 4-5ths Yarrow and 1-5th cylindrical boilers;

The *Carnarvon* (Messrs. Beardmore and Co.).—A combination of 4-5ths Nielauss and 1-5th cylindrical boilers;

The *Roxburgh* (the London and Glasgow Shipbuilding Company).—A combination of 4-5ths Dürr and 1-5th cylindrical boilers;

The *Argyll* (the Greenock Foundry Company).—A combination of 4-5ths Babcock and Wilcox and 1-5th cylindrical boilers;

The *Antrim* (Messrs. J. Brown and Co.).—A combination of 4-5ths Yarrow and 1-5th cylindrical boilers.

France.—The *Temps* issues details respecting some shooting practice carried out by the Northern squadron, an old warship, the *Surcouf*, being used as a target. Three hundred and forty shots had to be fired before she was sunk, and 41 of these shots were fired at a range of from 2,200 to 4,000 yards. The percentage of hits was 12 per cent., a very satisfactory average, the *Temps* considers, if one compares it with the percentage of hits in the battle before Santiago, viz., 2½, and takes into consideration the fact that the mark on this occasion was a much smaller one than that presented by the Spanish vessels. The squadron described an arc around the *Surcouf* in such a way that the ship, which is 312 ft. long, gave them from the most favourable point a target of 164 ft. and at the least one of 26 ft., a considerable portion of the practice being performed at the angle which made the objective smallest for the gunners. The weather was not clear.—The French Minister of Marine has given orders for the laying down of thirteen submarine boats; eight are to be constructed at Toulon, and five at Cherbourg. The new vessels are to be "submersible" like the *Naval*, and will be able to disappear from sight in five minutes. By the year 1906 France should be in possession of a fleet of 68 under-water craft.

Germany.—The German navy is occupied just now in making experiments in painting the torpedo-boats a colour most fitted to lessen the visibility of the craft in daylight. Instead of the coat of deep-black paint which has been peculiar to the German torpedo-boats for the last 20 years, these boats are now to be painted a grey-brown colour. Several boats now on duty have been painted the new colour. It is said that this new colour renders the boats scarcely noticeable, especially in the Baltic and northern waters. At the same time, there is no colour which is equally suitable for all waters. The German warships are painted a blue-grey, while those of all other nations are painted black as to their hulls, as that shade renders the ships least visible at night. On the other hand, vessels painted a blue-grey are not easily distinguished in daytime from the colour of the sky, the water, the coast, or amid powder-smoke.

Japan.—A programme of further naval expansion is believed to be contemplated by the Japanese Government.

According to the Tokio correspondent of the *Times*, the present navy, aggregating 245,000 tons displacement, will become 255,000 tons in 1905. After that year there will be a third programme, comprising ten ships with a total displacement of about 100,000 tons.

Russia.—A St. Petersburg telegram states that the Russian Caspian Sea fleet will be increased by two new steamers, the *Skobelev* and the *General Kuropatkin*, which are expected shortly from England, where they have been built. These two ships measure 250 ft. in length by 28 ft. in breadth. They have a speed of 14 knots, they burn naphtha for fuel, and are lighted with electricity.

MILITARY.

The King presented colours to the Irish Guards, on the Horse Guards' Parade, on the 30th ult.

The King has appointed Major C. J. Burgess, late of the Honourable Artillery Company and previously a Lieutenant in the 46th Regiment, a Military Knight of Windsor.

The Victoria Cross has been conferred on Surgeon-Captain A. Martin-Leake, South African Constabulary, for conspicuous bravery in the action at Viakfontein on February 8 last.

Colonel Villiers Hatton, C.B., formerly of the Grenadier Guards, has been appointed to command the Brigade of Metropolitan Militia battalions to be formed on Cowshot-common, between Pirbright and Bisley, on June 9.

The following officers of the Royal Army Medical Corps have been appointed principal medical officers as stated:—Colonel W. Donovan, C.B., now in South Africa, at Hong Kong; Colonel R. Blood, in the Belfast District; Colonel W. McWatters, in the Southern District; and Colonel R. H. Quill, in the South-Eastern District.

Colonel S. H. Winter, D.A.A.G., North-Western District, has been appointed to the command of the Army Service Corps in Egypt, and Lieut.-Colonel F. W. B. Koe, who has recently returned from Hong Kong, has been appointed to take over the command of the Army Service Corps in the North-Western District.

STATISTICAL NOTES.

Canada.—MINERAL PRODUCTION IN 1901.—The following statement, issued by the Geological Survey of Canada, shows a preliminary summary of the Mineral Production of Canada in 1901:—

(Subject to Revision).

Product.	Quantity.	Value.
METALLIC.		Dols.
Copper lb.	40,951,196	6,600,104
Gold, Yukon	—	18,000,000
" all other	—	6,462,222
Iron ore (exports) tons†	306,199	762,284
* Pig-iron from Canadian ore	83,100	1,212,113
Lead lb.	50,756,440	2,199,784
Nickel	9,189,047	4,594,523
Silver oz.	5,078,318	2,993,668
Zinc lb.	—	—
Total metallic	—	42,824,698
NON-METALLIC.		
Actinolite tons†	531	3,126
Arsenic	695	41,676
Asbestos and Asbestic	38,079	1,186,434
Chromite (exports)	1,759	25,444
Coal	6,186,286	14,671,122
Coke	373,625	1,264,360
Corundum	435	53,115
Felspar	5,226	4,710
Fire-clay	3,979	5,920
Graphite	1,440	28,880
Grindstones	5,701	55,690
Gypsum	293,799	340,148
Limestone for flux	169,399	183,162
Manganese ore (exports)	440	4,820
Mica	—	160,000
Mineral pigments—		
Baryta	653	3,842
Ochres	2,233	16,735
Mineral water	—	100,000
Moulding sand tons†	14,620	29,240
Natural gas	—	312,359
Peat tons†	220	660
Petroleum bbls.	588,528	953,415
Phosphate (apatite) tons†	—	—
Pyrites	28,261	113,044
Salt	59,428	262,328
Soapstone	—	—
Talc	259	842
Tripolite	—	—
STRUCTURAL MATERIALS AND CLAY PRODUCTS.		
Cement, natural rock brls.	133,328	94,415
" Portland	297,066	535,615
Flagstones	—	—
Granite	—	155,000
Pottery	—	200,000
Sands and gravels (exports) tons†	197,302	117,465
Sewer pipe	—	250,115
Slate	—	9,980
Terra-cotta, pressed bricks, etc.	—	278,671
Building material, including bricks, building stone, lime, tiles, etc.	—	4,820,000
Total structural materials and clay products	—	6,461,261
Total all other non-metallic	—	19,821,072
Total non-metallic	—	26,282,333
" metallic	—	42,824,698
Estimated value of mineral products not returned	—	300,000
TOTAL, 1901	—	69,407,031
" 1900*	—	63,775,090
" 1899	—	49,548,027
" 1898	—	38,697,021

* The total production of pig-iron in Canada in 1901 from Canadian and foreign ores amounted to 274,376 tons, valued at 3,512,923 dols., of which it is estimated 83,100 tons, valued at 1,212,113 dols. should be attributed to Canadian ore and 191,276 tons, valued at 2,300,810 dols., to the ore imported.

† The ton used is that of 2,000 lb.

‡ Vide IMPERIAL INSTITUTE JOURNAL for July, 1901, page 195.

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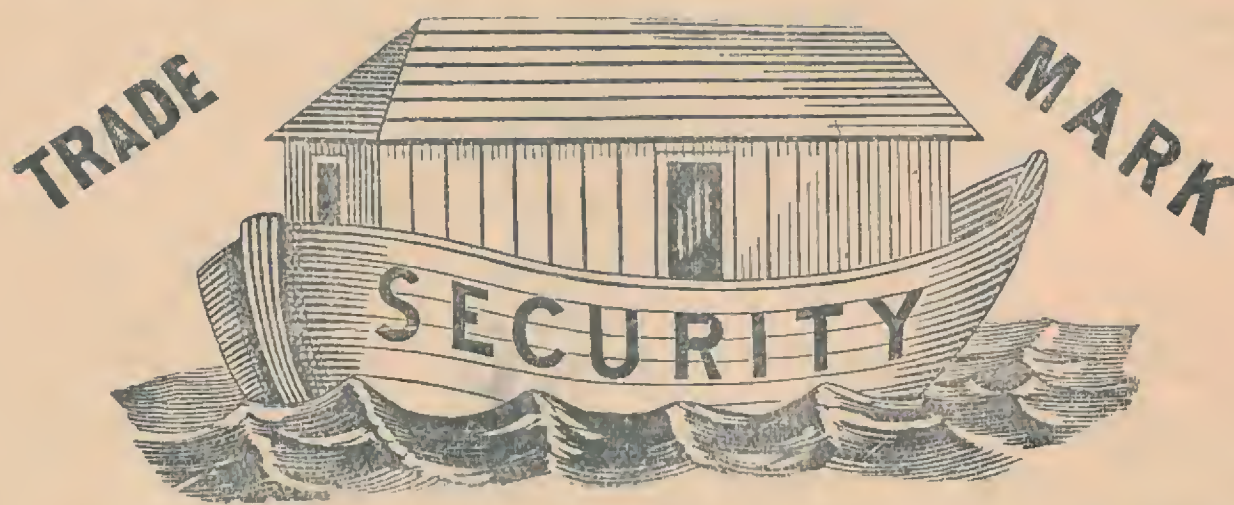
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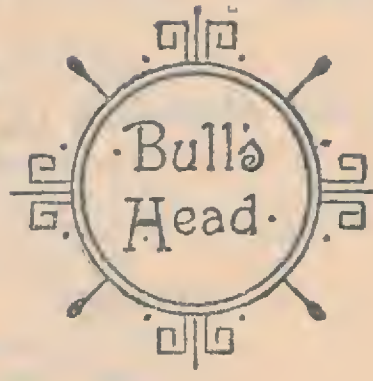
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The GOVERNOR OF THE BANK OF ENGLAND.

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Manitoba: THE PROVINCIAL SECRETARY.

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In the case of several Colonies correspondence is carried on through the Agent-General's Office or through the Representative Governor.

THE COMMERCIAL COLLECTIONS OF THE INSTITUTE.
BRITISH AFRICA.

(*West Central Lower Gallery.*)

CAPE COLONY.

Representative Governors.—Mr. THOMAS E. FULLER (Agent-General).

[ONE VACANCY.]

Corresponding Agent in Colony.—(At present through the Agent-General's Office.

Curator of Collection.—Mr. LEWIS ATKINSON.

Products Exhibited.—Agricultural produce, building stones, coal dried fruits, furs, minerals (including asbestos, gold-bearing quartz, copper ores, diamondiferous gravel, etc.), stuffed ostriches, ostrich eggs and feathers, Angora hair, tobacco, wines, wools, etc.

NATAL. (*West Central Lower Gallery.*)

Representative Governor.—SIR WALTER PEACE, K.C.M.G.

Corresponding Agent in Colony.—Mr. C. B. LLOYD, Commissioner of Agriculture and Mines, Natal.

Curator of Collection.—(In charge of Institute Staff.)

Products Exhibited.—Agricultural produce, Angora hair, tanning barks, building stones, coffee, cutlery, indigenous timbers, minerals, coal, silk cocoons, spirits, sugar, tea, tobaccos, wine, wools native ornaments, etc., etc.

RHODESIA AND BECHUANALAND.

(*West Central Lower Gallery.*)

Representative Governors.—Those of CAPE COLONY.

Curator of Collection.—Mr. LEWIS ATKINSON.

[Queen Victoria.

Products Exhibited.—Specimens of native workmanship kindly lent by the late

NYASSALAND, BRITISH CENTRAL AFRICA.

(*West Central Lower Gallery.*)

Products Exhibited.—(By the British Central Africa Chamber of Agriculture and Commerce).—Coffee, ivory, *Landolphia* rubber, chillies, *Strophanthus* seeds, beeswax, photographs, etc.

BRITISH AMERICA.

(*West and Upper West Central Galleries.*)

DOMINION OF CANADA.

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Curator of Collections.—Mr. HARRISON WATSON.

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[ONE VACANCY.]

Corresponding Agent in Province.—The COMMISSIONER OF AGRICULTURE.

Products Exhibited.—Canadian furs from Hudson's Bay Co., stuffed birds, wood pulp, slates, vehicles, minerals (asbestos, apatite, mica, plumbago, etc.), agricultural produce, fruits, tobacco, maple sugar, timber, Indian ornamental work, cotton, linen, and leather, and iron manufactures.

THE COMMERCIAL COLLECTIONS OF THE INSTITUTE—continued.

BRITISH AMERICA—continued.

DOMINION OF CANADA—continued.

PROVINCE OF ONTARIO.

Representative Governors.—SIR HENRY TYLER and JOHN PATON, Esq.

Corresponding Agent in Province.—Mr. ARCHIBALD BLUE, Director of Mines, Toronto.

Products Exhibited.—Agricultural produce, preserved fruits, indigenous timbers, gold, silver, iron, lead, and nickel ores, petroleum, marble, granite and decorative stones, coal, native wines, honey, canned meats, and woodwork.

PROVINCE OF BRITISH COLUMBIA.

Representative Governor.—The Hon. J. H. TURNER (Agent-General).

Corresponding Agent in Province.—(At present through Agent-General's Office.)

Products Exhibited.—Agricultural produce, coal, Douglas fir and other timbers, minerals, preserved fruit, tinned salmon, fish oils, woodwork, birds, and animals.

PROVINCE OF NEW BRUNSWICK.

Representative Governor.—C. A. DUFF MILLER, Esq., Agent-General.

Corresponding Agent in the Province.—The PROVINCIAL SECRETARY.

Products Exhibited.—Timbers, minerals, building stones.

PROVINCE OF MANITOBA.

Representative Governor.—The Rt. Hon. the LORD STRATHCONA and MOUNT-ROYAL, G.C.M.G.

Corresponding Agent in Province.—The PROVINCIAL SECRETARY.

Products Exhibited.—Agricultural produce (including barley, beans, corn, oats, peas, rye, wheat, flour, &c.); birds, comprising ducks, grouse, partridges, snipe, etc.; heads of wapiti, caribou, moose and other large game; specimens of native workmanship, photographs, head-dresses, clubs, arrows, beadwork, etc., etc.

PROVINCE OF NOVA SCOTIA.

Representative Governor.—JOHN HOWARD, Esq., Agent-General.

Corresponding Agent in Province.—(At present through Agent-General's Office.)

Products Exhibited.—Minerals, samples of iron ore and products manufactured from the ore, wood-wool.

NORTH-WEST TERRITORIES.

Representative Governor.—THOMAS SKINNER, Esq.

Corresponding Agent in Province.—(At present through the Representative Governor.)

Products Exhibited.—Grain.

NEWFOUNDLAND.

(Upper West Central Gallery.)

Representative Governor.—[VACANT.]

Corresponding Agent.—

Products Exhibited.—Minerals (including ores of iron, copper, manganese, chromium, lead, antimony and zinc, molybdenite, mispickel, mica, asbestos, steatite, granite, marble, slate, coal, and petroleum) and timber.

BERMUDA.

(Middle of Central Lower Gallery.)

Representative Governor.—Gen. SIR ROBERT BIDDULPH, G.C.B., G.C.M.G.

Corresponding Agent.—THE COLONIAL SECRETARY.

Products Exhibited.—Arrowroot, woods, silk, shell-work, and sandstone.

WEST INDIES.

(West Central Lower Gallery.)

BRITISH GUIANA, TRINIDAD, AND TOBAGO.

Representative Governor.—The Rt. Hon. the LORD STANMORE, G.C.M.G.

Corresponding Agent.—Trinidad and Tobago: THE COLONIAL SECRETARY.

Curator of Collection.—(In charge of Institute Staff.)

Products Exhibited.—Arrowroot, cereals and pulses, medicinal barks, cocoa, coral, coffee, indigenous timbers, lace, fibres, rum, spices, starches, sugars, timber, leather, skins, drugs, fish glue, basket-work, condiments, etc.

JAMAICA AND BAHAMAS, WINDWARD ISLANDS, AND BARBADOS.

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Corresponding Agent.—Jamaica: THE INSTITUTE OF JAMAICA. [C.I.E.]

Hon. Curator.—[VACANT.]

Products Exhibited.—Arrowroot, barks, cocoa, coral, coffee, indigenous timbers, lace-bark, fibres, rum, spices, starches, sugars, sarsaparilla, wax, oils, condiments, turtle, etc.

BRITISH HONDURAS.

Representative Governor.—J. McMURRICH CURRIE, Esq.

Corresponding Agent.—[VACANT.] *Hon. Curator of Collection.*—J. M. CURRIE, Esq.

Products Exhibited.—Banana and cassava meal, coconut oil, coffee, horns (deer), indiarubber, Indian corn, medicinal barks, pickles, preserved fruits, rice, rope and cordage of native manufacture, rum, seeds edible and ornamental, spices, sponges, sugar, mahogany and other timbers, tobacco, etc.

LEEWARD ISLANDS.

Representative Governor.—[VACANT.]

Corresponding Agents.—Grenada: THE COLONIAL SECRETARY.

St. Vincent: THE ADMINISTRATOR. *St. Lucia:* MR. T. H. DIX.

Products Exhibited.—Arrowroot, barks, cocoa, coral, coffee, indigenous timbers, fibres, rum, spices, starches, sugars, etc., etc.

FALKLAND ISLANDS. (Middle of Central Lower Gallery.)

Representative Governor.—Gen. SIR ROBERT BIDDULPH, G.C.B., G.C.M.G.

Corresponding Agent.—THE COLONIAL SECRETARY.

Products Exhibited.—Wool, birds' skins and eggs.

BRITISH AUSTRALASIA.

NEW SOUTH WALES.

(East Central Upper and Lower Galleries.)

Representative Governor.—The Hon. HENRY COPELAND (Agent-General).

Corresponding Agent in Colony.—(At present through Agent-General's Office.)

Products Exhibited.—Minerals (including gold, silver, coal, &c.), wool, indigenous timbers, wines, cereals, seeds, gums, resins, oils, fibres, rope, leather, tallow, etc., etc.

VICTORIA.

(East Central Upper and Lower Galleries.)

Representative Governors.—HOWARD SPENSLEY, Esq., and [VACANT]

Corresponding Agents in Colony.—(At present through Agent-General's Office.)

Officer in Charge of Collection.—Mr. A. G. BERRY (of the Agent-General's Office.)

Products Exhibited.—Animals, birds, coal, cereals, chemical manufactures, cigars, essential oils, gums, grain, hops, indigenous timbers, leather, leatherware, minerals (including auriferous quartz, coal, kaolin, etc.), models of gold nuggets, seeds, sugar, tobacco, wines, wool, etc., etc.

SOUTH AUSTRALIA.

(East Central Lower Gallery.)

Representative Governors.—H. A. GRAINGER, Esq. (Agent-General), and HENRY

BULL TEMPLAR STRANGWAYS, Esq.

Corresponding Agent in Colony.—(At present through Agent-General's Office.)

Officer in charge of Collection.—Mr. EDMUND SNELL (of the Agent-General's Office.)

Products Exhibited.—Agricultural produce, wines, indigenous timbers, furniture, wool, etc.

QUEENSLAND (AND BRITISH NEW GUINEA).

(East Central Lower Gallery.)

Representative Governors.—The Hon. SIR HORACE TOZER, K.C.M.G. (Agent-General), and Field Marshal SIR HENRY W. NORMAN, G.C.B., G.C.M.G., C.I.E.

Corresponding Agent in Colony.—(At present through Agent-General's Office.)

Curator of Collection.—(In charge of Institute Staff.)

Products Exhibited.—Building stones, eucalyptus oils, fibres, minerals, pearl shells, indigenous woods, cereals, models of fruits, sugar, wine, tinned meats, hides, skins, leather, etc., etc.

WESTERN AUSTRALIA.

(East Central Lower Gallery.)

Representative Governor.—The Hon. H. B. LEFROY (Agent-General).

Corresponding Agent in Colony.—(At present through Agent-General's Office.)

Curator of Collection.—(In charge of Institute Staff.)

Products Exhibited.—Wools, gums and resins, olive oil, fibrous barks, silk, skins, indigenous woods, minerals, model gold ingots, etc., etc.

TASMANIA.

(East Central Lower Gallery.)

Representative Governor.—The Hon. ALFRED DOBSON (Agent-General).

Corresponding Agent in Colony.—Mr. T. C. JUST, Chief Secretary's Office, Hobart.

Curator of Collection.—(In charge of Institute Staff.)

Products Exhibited.—Cereals, minerals, models of fruits, stuffed fish, furs, timbers, illustrations of local manufactures, etc., etc.

NEW ZEALAND.

(East Central Lower Gallery.)

Representative Governors.—The Hon. W. P. REEVES (Agent-General), and THOMAS

MACKENZIE, Esq. *Corresponding Agent in Colony.*—(At present through Agent-General's Office.)

Curator of Collection.—(In temporary charge of Institute Staff.)

Products Exhibited.—Agricultural produce, building stones, coal, Kauri gum, hemp and flax, tinned meats, wools, tobacco, Kauri and other woods, with illustrations of their application to structural and ornamental purposes; photographs, etc., etc.

FIJI.

(Middle of Central Lower Gallery.)

Representative Governor.—Gen. SIR ROBERT BIDDULPH, G.C.B., G.C.M.G.

Corresponding Agent in Colony.—Hon. JOHN HILL, Suva.

Curator of Collection.—(In charge of Institute Staff.)

Products Exhibited.—Barks, fibres, copra, tea, cocoa, coffee, timbers, etc.

BRITISH INDIA (AND ASIA).

INDIA.

(East Gallery and Pavilion.)

Representative Governors.—Vide p. 172.

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Curator of Collection.—Mr. J. R. ROYLE, C.I.E.

Products Exhibited.—Fodder grasses, foods and food stuffs, sugar, spices and condiments, models of fruits, narcotics (including opium, ganja, etc.), tobacco and cigars, tea and coffee, oils and oil-seeds (including those of castor, sesame, linseed, cocoa-nut and ground nut, etc.), a large assortment of drugs, dyes and tans, gums and resins (including the resins and turpentine of Indian pines, wax, lac, etc.), an extensive collection of fibres (including cotton, silk, jute, coir, reha, agave, etc.), models illustrating the manufacture of cotton and jute, minerals (including building stones, coal, mica, soapstone, corundum, iron ores, steel, etc.), timbers, collection of Indian pottery, carved woodwork, silver, brass and copper ware, silk and cotton fabrics.

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(East Gallery.)

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Executive Officer and Home Agent.—FREDK. H. M. CORBET, Esq., Barrister-at-Law.

Curator of Collection.—Mr. J. R. ROYLE, C.I.E.

Products Exhibited.—Cereals, pulses, edible fruits, roots and grains, spices and condiments, drugs, horns, skins, pearls, shells, wax, oils, gums, resins, dyes, tans, fibres, timbers, building stones, plumbago, metallic ores, rough gems, palm products, tea, coffee, cocoa, cinchona bark, sugar, tobacco, cotton-cloth, mats, rattan and basket work, wood and ivory carving, metal-work, pottery, tortoise-shell and porcupine quill work, lacquer work, lace, etc., etc.

STRAITS SETTLEMENTS (AND JOHOR).

(East Gallery.)

Representative Governor.—SIR CECIL CLEMENTI SMITH, G.C.M.G.

Corresponding Agents.—The COLONIAL SECRETARY (at Singapore); The Dato. JAMES

MELDRUM (for Johor). *Curator of Collections.*—(In charge of Institute Staff.)

Products Exhibited.—Barks, canes, drugs, fibres, preserved fruits (including Singapore pine-apples), mats, silk fabrics, oils and oil-seeds, dyes and tans, gums, gutta-percha, tin ores and other minerals, teas, coffee, spices, timbers, etc., etc.

MAURITIUS (AND SEYCHELLES).

(West Central Lower Gallery.)

Representative Governor.—[VACANT.]

Corresponding Agent in Colony.—Mr. A. DARUTY DE GRANDPRÉ, Museum Superintendent.

Corresponding Agent for Seychelles.—The Hon. E. B. SWEET-ESCOTT, C.M.G., Administrator.

Curator of Collection.—(In charge of Institute Staff.)

Products Exhibited.—Fibres, hemp, oils, rum, seeds, sugars, tortoise-shell, vanilla beans, with specimens of native workmanship, etc., etc.

HONG KONG.

(Middle of Central Lower Gallery.)

Representative Governor.—SIR WILLIAM ROBINSON, G.C.M.G.

Corresponding Agent in Colony.—The HARBOUR MASTER.

Curator of Collection.—(In charge of Institute Staff.)

Products Exhibited.—China, carved and inlaid ivory and wood-work, silver and lacquer ware, silk and cotton fabrics, drugs, paints, dyes, food stuffs, etc., etc.

BRITISH NORTH BORNEO.

(West Central Lower Gallery.)

Corresponding Agent.—(At present through the British North Borneo Co.)

Curator of Collections.—(In charge of Institute Staff.)

Products Exhibited.—Timbers, rattans, coal, rice, sago, sugarcane and raw sugar, coffee, cocoa pods, pepper, tobacco, beeswax, camphor, gutta-percha, kapok fibre, dammars, cutch and gambier, hemp, honey, etc.

BRITISH POSSESSIONS (EUROPE).

MALTA, GIBRALTAR, AND CYPRUS.

(West Central Gallery.)

Representative Governor.—Gen. SIR ROBERT BIDDULPH, G.C.B., G.C.M.G.

Corresponding Agent.—(At present through the Representative Governor.)

Curator of Collections.—(In charge of Institute Staff.)

Products Exhibited.—From Malta—Carved stone-work, lace, macaroni, honey, various fabrics, models, pictures, etc., etc. Gibraltar and Cyprus—None at present.

IMPERIAL INSTITUTE JOURNAL.

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JULY, 1902.

GENERAL NOTICES.

"THE IMPERIAL INSTITUTE JOURNAL."

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
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 This JOURNAL is distributed (by post) throughout the United Kingdom, India, and the Colonies of the British Empire, and to the following Foreign Countries:—Argentina Republic, Austria-Hungary, Belgium, Bolivia, Chili, China, Colombia, Costa Rica, Denmark, Egypt, France, Germany, Greece, Hawaiian Islands, Holland, Italy, Japan, Mexico, Montenegro, Morocco, Norway, Persia, Peru, Portugal, Russia, Siam, Spain, Sweden, Switzerland, Tripoli, Turkey, United States of America, Uruguay, and Venezuela. The JOURNAL is also placed in the Reading Rooms of CHAMBERS OF COMMERCE, CLUBS, and HOTELS, both at home and abroad.

SPECIAL NOTICE.

EXHIBITION OF GIFTS AND ADDRESSES PRESENTED TO THE PRINCE AND PRINCESS OF WALES, DURING THEIR COLONIAL TOUR IN 1901.

His Royal Highness the PRESIDENT of the IMPERIAL INSTITUTE has decided that an EXHIBITION shall be held in the North Gallery of the Institute of the GIFTS and ADDRESSES presented to their Royal Highnesses the PRINCE AND PRINCESS OF WALES on the occasion of their visiting the Colonies in 1901. The Exhibition is open to the Public (Admission 1s.) on week-days, from 11 a.m. to 7 p.m. until further notice. The PRINCE OF WALES has also decided that the proceeds of the Exhibition shall be added to the "CORONATION GIFT" to KING EDWARD'S HOSPITAL FUND.

SPECIAL EXHIBITION OF COLONIAL PRODUCTS AND INDUSTRIES.

A Special Exhibition of Collections illustrative of the Mineral Wealth and of certain Industries of the DOMINION OF CANADA, also of commercial products from QUEENSLAND, RHODESIA, WESTERN AUSTRALIA, and BRITISH NORTH BORNEO, is on view in the western half of the North Gallery, from 11 a.m. to 7 p.m., on week-days—**Admission Free.**

The whole of the Collections at the Institute will be open until 7 p.m. during the continuance of the Exhibition of Gifts and Addresses.

COMMERCIAL COLLECTIONS.

The Galleries containing the Colonial and Indian Collections, and the Public Commercial and Industrial News Room, are open for free inspection by the public daily, *except Sundays, and any days specially notified*, from 11 a.m. until 7 p.m. Every information concerning the products, their supply, etc., can be obtained on application to the Curators of the Indian and Ceylon, Canadian, and South African Sections, to the general Curator, and to the Commercial Intelligence Department.

FELLOWS' DEPARTMENT.

The Reading, Writing, and News Rooms, are open for the use of Fellows every week-day from 10 a.m. till 11.30 p.m., and on Sundays from 3 p.m. to 10.30 p.m. The Library (on the First Floor), is open from 10 a.m. to dusk on Week-days, and from 3 p.m. to dusk on Sundays. The Map Room (First Floor) is open from 10 a.m. to 5 p.m. on Week-days.

The Poste Restante is open every week-day for receipt and delivery of letters and parcels. Letters addressed to initials only are not received, except in reply to notices in the JOURNAL, under "Requirements" Registry. The General Post Office Pillar Box is cleared daily twelve times, between 10.10 a.m. and midnight. Light refreshments only are, for the present, provided in the Fellows' Rooms and at the bar of the Ceylon Kiosk.

EMIGRATION INFORMATION OFFICE.

The Office of the British Women's Emigration Association (*see page 189*), in the West Corridor, First Floor, is open daily from 10 a.m. to 4 p.m., and advice and information respecting emigration and openings in the Colonies may be obtained there free of charge. Enquiries of all kinds relating to the Colonies from intending Emigrants are dealt with in the Commercial Intelligence Department, and special information respecting Canada and the Cape Colony may also be obtained from the Curators for these Colonies, on application personally at their offices, or by letter.

ANNUAL MEETINGS OF THE INSTITUTE.

The Annual Meetings of the GOVERNORS and of the FELLOWS of the INSTITUTE were held on the 20th ult. A report of the proceedings, and also a report of the progress of the Institute during the past twelve months, will appear in the AUGUST number of this Journal.

SCIENTIFIC AND TECHNICAL DEPARTMENT.

The Scientific and Technical Department of the Institute has been established to acquire information by special enquiries and by experimental research, technical trials and commercial valuation regarding new or little known natural or manufactured products of the various Colonies and Dependencies of the British Empire and of foreign countries, and also regarding known products procurable from new sources, and local products of manufacture which it is desired to export. This work is carried out with a view to the creation of new openings in trade, or the promotion of industrial developments.

In the extensive and well-equipped series of Research Laboratories occupying the West Corridor of the Second Floor, a staff of skilled Chemists, under the direction of Professor Wyndham R. Dunstan, M.A., F.R.S., carry out the investigation of the chemical constitution and properties of new dye-stuffs, tanning materials, seeds and food-stuffs, oils, gums and resins, fibres, timbers, medicinal plants and products; animal products, minerals and ores, soils, cements, and various other products, with a view to their commercial utilization. Whenever necessary these materials are submitted to special scientific experts, by whom they are made the subjects of particular investigation or practical tests. Reports are also obtained from technical or trade-experts in regard to the probable commercial or industrial value of any such products, whilst full information is collected from official or other trustworthy sources regarding the probable extent and cost of available supplies. All materials requiring scientific or technical examination, or commercial valuation, should be submitted to the Institute for examination either by, or through the Foreign Office, the Colonial Office, the India Office, or the Board of Trade, or through the Colonial or Indian Government Authorities. Requests for the examination of such materials may also be submitted by Public Commercial Bodies and Institutions of the respective Colonies and Dependencies, or by the Representatives of H.M. Government in foreign countries.

COMMERCIAL INTELLIGENCE DEPARTMENT.

The Office of this Department, in the West Corridor, First Floor, is open daily from 10 a.m. to 5 p.m. (on Saturdays till 1 p.m.), for the purpose of answering enquiries and supplying information relating to the Commerce (Export and Import) and Industries of India and the Colonies. Applications may be made personally or by letter. Special information may be obtained from the Curators in charge of the Indian and of certain Colonial Collections. Arrangements have been made for the translation for mercantile firms of Trade Circulars, Price-Lists, and Catalogues into any Foreign Language, including the conversion of weights, measures and coinages, etc., at cost price, and application for such may be addressed to this Department.

CITY BRANCH OF THE IMPERIAL INSTITUTE.

REMOVAL TO 49, EASTCHEAP, E.C.

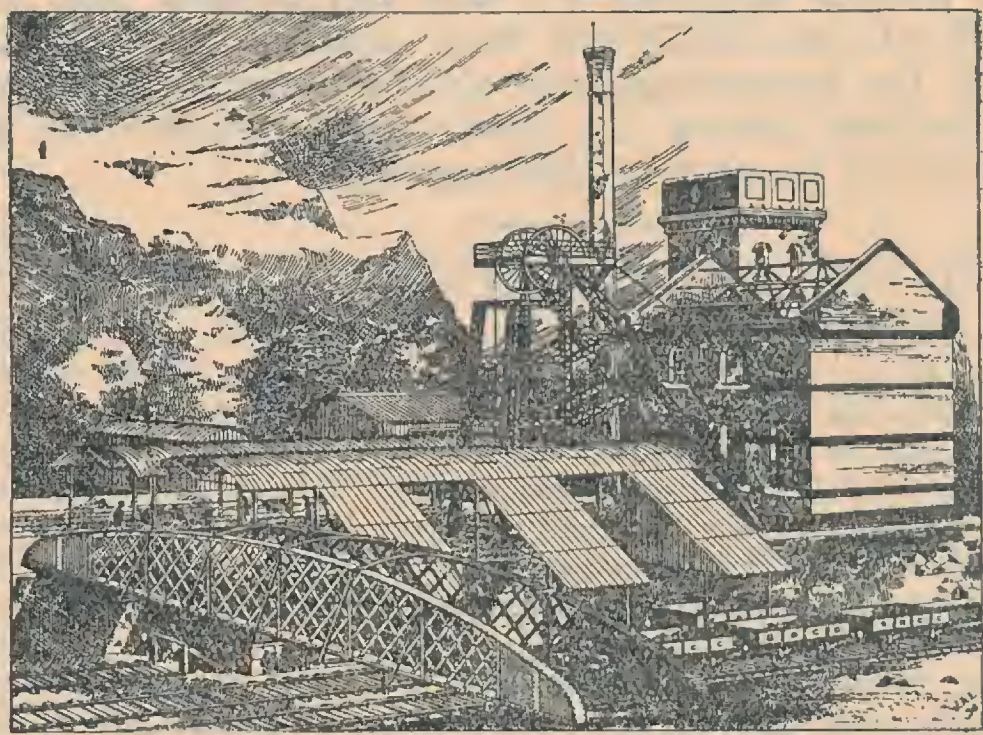
The City Enquiry Office and Reading Room have been removed from 112, Cannon-street to larger premises at 49, EASTCHEAP, where a commodious apartment is also provided for the display, to merchants, manufacturers, etc., of raw and manufactured products received, from time to time, from the Colonies and from India, and for which it is desired to find openings in British markets. Curators and other members of the Imperial Institute staff will attend at the Office, at stated times and by special appointment, to deal with enquiries and to assist in establishing or facilitating business relations with mercantile houses, etc., in the Colonies and India. The City Branch is in constant communication, by telephone and messengers, with the Imperial Institute, South Kensington. (*For further information see page 188*).

THE NORTHBROOK SOCIETY.

The Northbrook Society is affiliated to the Imperial Institute, and has a special room allotted for the exclusive use of its members in the Institute buildings. Its primary objects are to watch over and promote the interests of natives of India, and to provide a system of guardianship or supervision over such as are sent to Europe for education. The Society is controlled by a committee consisting of an equal number of Governors of the Imperial Institute and members of the Society, presided over by the Earl of Northbrook. It possesses an excellent library. Indian members, who pay no subscription to the Society, have the especial advantage of becoming Fellows of the Institute at half the usual subscription payable by the ordinary Fellows. Applications for membership of the Society should be addressed to the Secretary of the Northbrook Society, Imperial Institute, London, S.W.

"REQUIREMENTS" REGISTRY.

With the object of affording Fellows of the Imperial Institute, and the General Public resident in the United Kingdom, an opportunity of making known special "wants" or "needs" in the British Colonies, India, and Foreign Countries, space will be regularly devoted to *approved* notices in a column reserved for this purpose. Advertisers may have their replies addressed to them direct, *c/o the Imperial Institute, London, S.W.*, under a distinctive number and initials. The cost of postage will be charged for the transmission of replies delivered at the Institute. Residents in the Colonies and India, and Foreign Countries, can register in like manner. (*For further particulars see page 187*).

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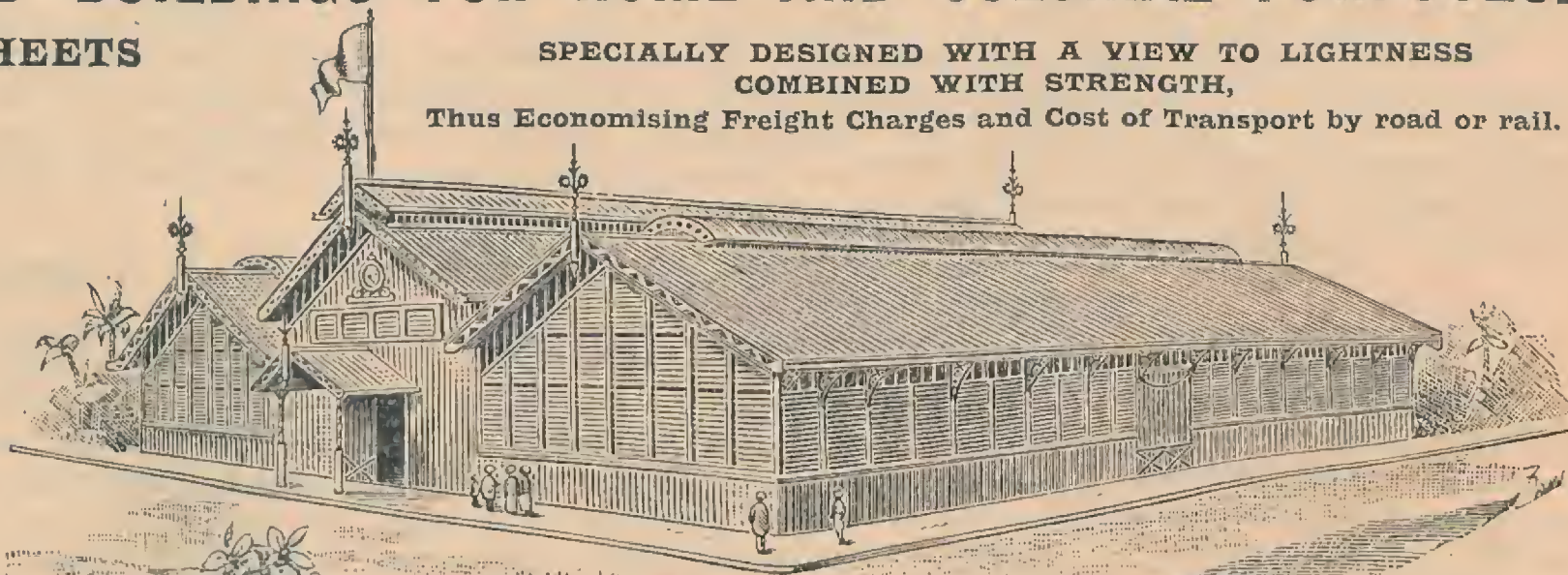
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FINANCIAL AND COMMERCIAL RETROSPECT.

UNITED KINGDOM.—The Board of Trade Returns of British foreign trade in May are fairly satisfactory, there being an increase of £411,258 on the total of imports and exports as compared with May of last year, when the number of working days was the same. The imports were valued at £43,353,705, showing an increase of £926,946, or 2·1 per cent. This increase was spread over all classes of articles, except living animals for food, chemicals, raw materials for textiles, and raw materials for sundry industries. Among the last the falling off mainly occurred in wood, which declined in value from £1,903,444 to £1,297,752, and in quantity from 749,501 loads to 540,690 loads. In materials for textile industries there was a decrease of 20 per cent. in the quantity of cotton imported, and of 18·4 per cent. in its value; Egypt and Brazil sent larger consignments, but those from India and the United States were much smaller. In sheep's wool, too, there was a decrease of over 12 per cent., both in quantity and value, the British colonies sending less, though Belgium and France sent more. As to cereals, there was a very large increase in wheat, which rose in value from £1,676,698 to £2,893,824, or 72·5 per cent., and in quantity from 4,938,400 cwt. to 8,354,061 cwt. (69·1 per cent.); the United States, Canada and Argentina were mainly responsible for the larger consignments. Wheat flour fell off over 19 per cent., both in quantity and value; barley increased 21·6 per cent. in the former respect, and 25·2 in the latter; oats fell off 28·2 per cent. and 10 per cent.; while Indian corn increased in value from £894,157 to £1,019,682, the rise in quantity being much less. Rice more than doubled in amount, but its value only increased 26·7 per cent. In refined sugar there was a big drop of 39·5 per cent. in quantity and 49·9 per cent. in value, but raw sugar rose 54·6 per cent. in amount, its value, however, being fractionally smaller. Unmanufactured tobacco also increased largely, rising in value from £131,360 to £197,836, or 50·2 per cent., though its value was only 36·9 per cent. better. The largest movement of all was shown by nitrate of soda, which increased 210·1 per cent. in quantity and 236·4 per cent. in value. The exports of British and Irish produce declined 2·1 per cent. in value, from £23,336,662 to £22,831,974. This decrease is more than covered by coal alone, which was less in quantity by 417,628 tons (9·7 per cent.) and in value by £674,237 (22·4 per cent.). Iron and steel improved substantially, gaining 6·5 per cent. in quantity and 14·8 per cent. in value. Machinery also improved from £1,637,804 to £1,854,429, or 13·2 per cent. New ships sold to foreigners were more by £17,734. Cotton yarn and cotton piece-goods were both more in quantity but less in value, the increases being 7·7 and 1·6 per cent. respectively, and the decreases 1·0 and 2·8 per cent.; of the piece-goods the Philippine Islands, China, Japan and British South Africa took more, but less was sent to Turkey, Morocco, Persia, Colombia and Argentina. In woollen and worsted yarns there was an increase in quantity of 10·3 per cent., but a decrease in value of 11·8 per cent., while in woollen and worsted tissues there was a decrease in both respects. Chemical manures improved 16·9 per cent. in amount and 20·7 per cent. in value; and in soda-compounds the improvement was 26·7 and 17·5 per cent. in the two respects. The re-exports of colonial and foreign merchandise were valued at £5,256,747, against £6,056,229, the decrease thus being £799,482.

The conclusion of peace in South Africa necessitated a revision of the provisions of the Budget. The original estimates were, it will be remembered, for a revenue of £152,935,000, and an expenditure of £184,469,000. This latter sum included an item of £17,750,000 for contingencies, which has now been dispensed with. Instead, £750,000 has been added for Constabulary in South Africa, provision has been made for a grant of £250,000 in aid of the West Indies, and the sinking fund of £4,640,000, which was suspended, has been allowed to stand.

COLONIES.—A proclamation was issued at Pretoria on June 9th, substituting for the 5 per cent. tax on the net profits of mines imposed by the Transvaal Volksraad, a tax of 10 per cent. on the net produce obtained from the working of claims, mynpachts, and other gold-bearing grounds in the Transvaal colony. This net produce is to be taken as the value of the gold produced after deduction of the cost of production and of the sums allowed for exhaustion of capital, as provided in the proclamation. The output of gold from the Witwatersrand mines which have so far re-started crushing was 138,602 oz. of fine gold in May last; in the preceding month the amount was 119,588 oz. In New South Wales the output was 16,865 oz., compared with 17,032 oz. in May of last year; in Queensland the amount was 77,900 oz.; in Victoria the yield was 66,150 oz., an increase of 5,672 oz. In Western Australia the output was 171,813 oz., obtained from 151,538 tons of ore; in May of last year the amount of gold was 147,395 oz. and of ore treated 129,885 tons. New Zealand's yield was 48,157 oz., compared with 36,457 oz. last year.

The following table shows the fluctuations which have occurred in certain Colonial Government securities during the last three months:—

	28th April.	28th May.	30th June.
Canada 3 per cent. . . .	102½-103¾	103½-104	102-102½
Cape 3 per cent. . . .	97¼-97¾	98-98½	97¼-97¾
Natal 3 per cent. . . .	95-96	96½-97½	97-97½
New S. Wales 3 per cent. . .	95¼-96¼	95-95½	95¼-95½
New Zealand 3 per cent. . .	95½-96	95½-96	96-96½
Queensland, 3 per cent. . .	95¼-96¼	95¼-96¼	94½-95
South Australia 3 per cent. .	95-95½	96-96½	95¼-95¾
Tasmania 3½ per cent. . .	103½-104½	104½-105½	103½-104½
Victoria 3 per cent. . . .	97¼-97¾	98¼-98¾	97¼-97¾
West Australia 3 per cent. .			
(May-Nov.)	93½-94½	94½-95½	94½-95½

INDIA.—The reports of most of the Indian railways for the second half of last year are now available. According to the *Economist* the figures,

reduced to a common basis at the rate of 15 rupees to £1, show that there was an increase in passenger receipts of £215,094, while in merchandise the improvement was only £25,932; indeed, of the 13 railways, seven have to report a falling-off in goods traffic. The gross receipts showed a total expansion of £281,713. Most of the lines were able to secure an increase in their net earnings, the aggregate of which was £3,497,274, against £3,248,479 in the same period of 1900, and also to reduce the proportion of gross revenue spent in working expenses.

The fluctuations which have occurred in the stocks of certain of the more important lines are shown in the following table:—

	29th April.	29th May.	30th June.
Bengal and North Western . .	130-134	130-134	129-133
Bengal-Nagpur Gua. 4 per cent. .	104-108	105-109	105-109
Bombay, Baroda & Cent. India .	158-163	160-164	158-162
Indian Midland 4 per cent. . .	104-108	105-109	104-108*
Madras Grntd. 5 per cent. . .	132-136	135-139	137-141
South Indian 4½ per cent. Deb. .	138-143	138-143	137-141
Southern Mahratta 3½ per cent. .	106-109	106-109	105-108*

* Ex. div.

FOREIGN COUNTRIES.—In Italy the financial situation has, of late, undergone a distinct change for the worse. For the financial year ending on June 30, 1901, there was a surplus of nearly £2,000,000, and for the present financial year a surplus of over £1,000,000 was originally expected. But now this estimate has been reduced to £500,000, less the cost of militarizing the railway men, calling out the 1878 class of reserves, etc., in all £380,000, and even the remaining £120,000 seems in danger of being swallowed up by unforeseen outlays. The revenue during 1901-1902 has been better than that of the preceding year by half-a-million sterling, though of late it has shown a disposition to fall off, but the expenditure has increased by nearly double that amount. For this, in some quarters, the blame is thrown on the Treasury Minister, Signor di Broglio, who is accused of not being sufficiently firm in resisting demands for increased expenditure, and who, it is said, has already accumulated engagements for the coming financial year which will require an expenditure at least £500,000 greater than during the current year, without any reasonable hope of a corresponding increase in revenue.

In Spain, the loan of £13,536,000 sterling of new Five per cent. Redeemable Stock, guaranteed by the tobacco monopoly, attracted applications to the amount of £155,491,908 sterling. Naturally, therefore, applicants received only a small proportion of what they asked for, the more so that one-third of the issue was reserved for the holders of Treasury Bonds, whose applications were not considered *pro rata* at all.

The preliminary report of the Council of the Ottoman Public Debt states that for the financial year ending March 13 last, the receipts were £T2,126,591, an increase of £T58,682 on the preceding year. In the revenues directly administered by the Council, there was a decrease of £T35,475. But the Turkish Government paid up £26,245 of the balance outstanding on account of the Cyprus revenues, and the receipts from the Tobacco Régie exceeded those of the previous year by £T57,798. The Bulgarian Government, however, were again in complete default. The money was spent as follows:—Service of priority bonds, £T430,500; extraordinary sinking fund, £T159,000; ordinary sinking fund, £T307,318; interest on converted debt at 1 per cent., £T1,005,025; interest on lottery bonds, £T156,326, and on prescribed bonds £T9,458. Of the balance of £T58,464, the special account of the Turkish Lottery Bonds receives £T7,721 and the residue is carried to the reserve fund for increasing the rate of interest on the converted debt. During the year a sum of £T671,435 was applied to the redemption of outstanding bonds.

The report of the Suez Canal for 1901 states that the total receipts for that year were 10,000,000f. more than in the preceding one, and that for the first time the transit dues exceeded 100,000,000f. During the year 3,699 ships, with a net tonnage of 10,823,840, passed through the canal. In 1900 the number was 3,441 and the tonnage 9,138,152, the increase for 1901 being thus 258 ships and 1,685,688 tons. These results are the more satisfactory in that they were obtained under quite normal conditions.

A recent Foreign Office report by the Consul-General at Bushire on the trade of the Persian Gulf does not show that much success is attending Russia's efforts to seize the trade of that region. In 1901 the total tonnage entering the Gulf was 558,080 tons, against 508,075 in 1900, and of this 466,663 tons were British in 1901 and 408,664 tons in 1900. In 1900 Russia's share was nil, and last year it was 12,713 tons. France in 1901 had 640 tons against 920 in 1900, and Austria-Hungary which had 1,500 tons in 1900, had nothing in 1901. The total value of the imports was £3,617,409 in 1901, against £2,873,485 in the preceding year. Of this total in 1901, the United Kingdom had £1,061,125 (£788,114 in 1900), India, £1,296,799 (£1,034,824 in 1900); France, £174,303 (£119,712 in 1900); Germany, £21,341 (£23,078 in 1900); Russia, £210,300 (£125,112 in 1900); the Arab Coast, £276,881 (£189,424 in 1900); and Persian Ports, £423,932 (£438,059 in 1900). Of the exports, India, in 1901, took the largest share with £1,017,679 (£745,142 in 1900), Persian ports took £417,769 (£346,449 in 1900); the Arab Coast, £247,983 (£207,061 in 1900); China, £289,836 (£318,611 in 1900); the United Kingdom, £119,351 (£163,716 in 1900); Russia, £167,383 (£192,172 in 1900); Germany, £12,021 (£14,747 in 1900); France, £914 (£7,664 in 1900).

Our usual table of exchanges follows:—

	28th April.	28th May.	28th June.
Paris, cheques	25f. 18c.	25f. 21c.	25f. 17c.
Berlin, sight	20m. 48½pf.	20m. 49pf.	20m. 46½pf.
Vienna, sight	24kr. 01¾h.	24kr. 3h.	24kr. 1h.
Amsterdam, sight . . .	12fl. 13½	12fl. 14½	12fl. 14½
Madrid, sight	—	34ps. 65	34ps. 40
Lisbon, sight	—	41½d.	42½d.
St. Petersburg, 3 months .	—	94r. 20	94r. 10
Bombay, T.T. . . .	1s. 3¾d.	1s. 3¾d.	1s. 3¾d.
Calcutta, T.T. . . .	1s. 3¾d.	1s. 3¾d.	1s. 3¾d.
Hong Kong, T.T. . . .	1s. 8½d.	1s. 8½d.	1s. 8½d.
Shanghai, T.T. . . .	2s. 3¾d.	2s. 3¾d.	2s. 3¾d.

AGRICULTURAL RETROSPECT.

UNITED KINGDOM.—The copious rains which fell throughout the first three weeks of June—making a total of seven weeks' continuous wet weather—do not appear to have had any serious ill effect on the crops. The spell of fine weather at the end of last month fortunately arrived in time to save the hay, and a very bulky crop has now been carted and stacked in good condition. The hot sunshine speedily caused the ears of wheat to emerge, and barley and oats, which had had sufficient rain, were greatly benefited by the warmth of the sun's rays. Weeds seem to be exceptionally plentiful this season, especially on wheat land. Turnips and swedes are making capital growth, and the heavy rains have washed off the vermin by which they were infested. Mangels, too, are growing satisfactorily, and, with the abundance of feed in the pastures, graziers' prospects have much improved. The gold medal of the British Dairy Farmers' Association has been awarded by the council of that body to Lord Rothschild, Tring Park, Herts, for the business-like character of his farms and the exceptionally high dairy qualities of his several breeds of cattle; also to Dr. Watney, Buckhold, Pangbourne, in recognition of his valuable work in developing the butter-making qualities of Jersey cows. A good idea of what may be done in breeding and selecting cows for their milking capabilities is offered by the milk records of a few first-rate breeds. In the short period of thirteen years Lord Rothschild, at Tring Park, has bought, bred, and reared three herds which it would be difficult to surpass for milking qualities. In the twelve months ending with September last, 36 shorthorn cows, which had been in the herd the whole year, averaged a yield of 640 gallons each. One cow gave 113½ gallons, a second, 946; a third, 921; and a fourth, 897. Forty-three red polled cows averaged 673 gallons, one having yielded 1,156 gallons, and two others over 1,000 gallons each. Thirty-one Jerseys averaged 618 gallons, the highest yield of an individual cow reaching 1,029 gallons, which is very remarkable for a Jersey, while a second gave 958 gallons. The cow that gave the greatest yield, Sultana XIV., was thirteen years old in May, 1901, and had produced her twelfth calf. Five other cows in the herd had had nine to twelve calves. Dr. Watney, of Buckhold, Berks, also shows remarkable milking records, with astonishing butter production, for his admirable Jerseys. Including heifers, his average in 1901 was over 600 gallons of milk for 40 animals, and in the preceding year it was nearly 606 gallons. More striking still are the butter records. One cow, Red Maple, produced last year 550 lb. of butter, while three gave over 500 lb. each, twelve over 400 lb., and the whole 40,394 lb., as their average. In the preceding year, Lavanja gave 569 lb. of butter, and 39 cows averaged 376 lb. In 1899, Mariatt's Lass produced 544 lb., and the average of 32 cows was 398½ lb. Mr. Hanbury has given great satisfaction to dairy farmers in this country and in the Colonies by his reply to the deputation from the chambers of agriculture received by him recently, on the subject of milk-blended butter. He not only admitted that this sophisticated commodity ought not to be sold as butter, and that legislation to regulate its sale needed to be carried through Parliament this year, but also stated that a Bill had been drafted, embodying the restrictions which appeared desirable, and that it was his intention to use his influence with his colleagues in the Government in favour of pushing the Bill forward. The last of the great country meetings of the Royal Agricultural Society begins on the 5th inst., the place selected being Carlisle. The entries are very satisfactory, and, given fine weather, a large number of visitors, from both sides of the Border, may be anticipated.

COLONIES.—A revised return of the wheat crop of NEW SOUTH WALES, issued by the Government statistician, shows a great decrease as compared with the preliminary estimate. Early last December it was reckoned that 1,470,000 acres would be reaped for grain, and that the yield would be 18,768,690 bushels. Now the area is put at 1,387,434 acres, and the production at 14,705,733 bushels, or 10·6 bushels per acre. Even this reduced quantity, however, is greater than the crop of any previous year, excepting that of 1900-1, which was over 16,000,000 bushels. The surplus is put at 6,056,000 bushels, of which 1,000,000 are supposed to be unfit for export, and only fit for consumption by live stock. From the agricultural returns of SOUTH AUSTRALIA for 1901-2, it appears that the total area of wheat sown was only 1,743,452 acres, or 169,795 acres less than in the preceding season. Of this area, 1,415,658 acres were cut for grain, showing a falling off of 158,559 from the reaped area of 1900-1. The yield is estimated at 8,012,762 bushels, or only 5·66 bushels per acre, a miserable crop that cannot possibly pay expenses. Last season the yield averaged 7·15 bushels per acre, which was bad enough. Yet there are settlers venturesome enough to sow wheat beyond Goyder's line of rainfall, where the yield last harvest was only 3·7 bushels per acre. The long series of droughty seasons in Australia clearly show the necessity for the new Commonwealth to take up the question of drought prevention or that of the best remedies. Drought seems to be as common in Australia as in India, and even more destructive in proportion, owing to the fact that all animal and vegetable products in Australia are affected by the same season, whereas harvesting in India is spread over many periods of the year. Consequently, artesian wells and systems of irrigation are needed as much in Australia as in India. The subject of deep wells, water storage, and irrigation, is one of the greatest importance, and demands the serious attention of Australian statesmen.

INDIA.—The annual report on tea culture in Assam for the year 1901 shows a desirable decrease in the production, due to planters having at last realised the necessity of putting an end to the over-production of the last few years, and of turning out a better quality of tea. The total area of tea gardens is

returned at 1,049,018 acres, being a decrease for the year of 11,069 acres. The number of persons permanently employed decreased from 468,326 to 451,005, while the number temporarily employed increased from 35,324 to 37,862. The out-turn of tea was 134,896,317 lb. against 141,118,644 lb. in 1900, a decrease of 6,222,327. The average prices per pound of tea in Calcutta were, for Surma valley teas 4 as. 7 p. per lb., and for Brahmaputra valley tea 6 as. 1 p. per lb. These average figures show a slight improvement compared with 1900.

FOREIGN COUNTRIES.—Prospects for the wheat crop in the principal producing countries have generally improved, reports from France, Austria-Hungary, Italy, and Russia indicate satisfactory development as having taken place during the past fortnight, and the outlook in Roumania and Bulgaria has become better since the wet period ended. In the United States the weather has been favourable of late, and the prospects of the winter and spring crops are said to have improved; and in Argentina it is expected that the area of the wheat crop will be expanded.

The importance of the English market to the stock breeders of ARGENTINA is clearly indicated in the decline in the shipments of live cattle and sheep from the River Plate since the closing of the British ports two years ago. In the first quarter of 1900, when the British ports were still open, the shipments of live cattle from Argentina numbered 58,752 head. With our ports closed this total fell to 27,932 in the first quarter of 1901, and has again declined by one-half to 13,177 in the opening quarter of the present year. Simultaneously there has been a much greater falling-off in the number of live sheep exported. Thus, from 175,280 sheep exported on the hoof in the first three months of 1900, there was a decline to 8,322 in the same period of 1901, whilst in the opening quarter of 1902 the number was still as low as 8,982. In other words, the trade was reduced almost to extinction last year, and there has yet been but little recovery. The time is no doubt approaching when it will be safe to re-open our ports to live animals from Argentina, and a determined effort will then be made by the breeders in the valley of the Plate to recover the lost trade. The enormous decrease in the shipments of live sheep has found no compensation in any substantial increase in the exports of frozen mutton, for, though these rose from 13,115 tons in the first three months of 1900 to 16,985 tons in the same period of 1901, there is a decline of 2,869 tons to only 14,116 tons in the opening quarter of the present year. With frozen beef the case is very different; for the first three months of the years named the exports have expanded from 3,539 tons in 1900 to 8,271 tons in 1901, and to 11,831 tons in 1902. The trade in jerked beef (*tasajo*), which is practically all with adjacent South American countries, has experienced a marked revival, the 7,693 tons shipped in the first three months of this year being more than treble the corresponding quantity last year. A heavy increase is to be noted under the head of wool, the export of which over the first three months of this year is nearly double the corresponding quantity two years ago. The export butter trade appears now to be established on a permanent basis. The shipment for the first three months of the present year falls not far short of a thousand tons (2,137,568 lb.), and is almost twice the corresponding quantity a year ago (1,133,588 lb.). The expansion of this trade needs to be carefully watched by Australasian butter makers, to whom the Argentine dairy farmers may in time become strong rivals upon the British markets. Australasia and Argentina being both south of the equator their butter seasons are the same, whilst the latter is only half as far from England as the former. The exports of 201,837 tons of wheat and 33,676 tons of maize this year are only one-third of the corresponding quantities in 1900, and considerably less than those in 1901. The shipments of linseed, on the other hand, are well maintained, the first quarter's total of 246,129 tons differing to the extent of only 340 tons from the corresponding total last year.

LABOUR RETROSPECT.

UNITED KINGDOM.—No noteworthy change has taken place in labour conditions during the past month. The decision of Lord James, who was called in to arbitrate on the subject of the wages in the Midland coal trade, was a foregone conclusion, and the 10 per cent. reduction will come into operation at once. In the cotton industry the number of looms idle shows no decrease, and the outlook is no better. An improvement is slowly but surely taking place in iron-mining, in the pig-iron industry, and in the tin-plate trade. In iron and steel manufacture, the engineering and metal trades, as also in the shipbuilding trades, employment continues to decline. Some interesting comparisons of the conditions of the iron and steel industries of the United Kingdom with those of the United States has been brought to light, through the evidence submitted before the Industrial Commission by the leading men in the industry. Among such questions, the *Iron and Coal Trades' Review* calls attention to one that has been much discussed through late years, namely, that of the average rate of wages paid in certain departments of the American industry relatively to our own. It is difficult to reach a satisfactory conclusion on this complex matter, in view of the fluctuations that are found to prevail, not only in different localities, but also at different works in the same locality. But one of the most recent and valuable pieces of statistical evidence on this matter is a statement of the *personnel* of the Federal Steel Company, and of the average remuneration which it was receiving at two different dates in the course of the recent boom. From this statement it would appear that of the total *personnel* in August, 1899, 1·4 per cent. were engaged at headquarters as clerks, etc., nearly 3 per cent. were engaged in general superintendence, 34 per cent. were skilled labourers at works, and 45 per cent. were unskilled labourers, while the remainder were miners and coke workers. A very important economic feature brought out by this statement is that skilled labour was paid about 50 per cent. more wages than unskilled, which may be taken as typical of the conditions that

prevail in American iron and steel works generally. Here we have an extremely influential factor in the determination of profits. The recent tendency in the United States has been to reduce the percentage of skilled labour employed as far as possible, and substitute unskilled labour, this operation being facilitated by the increasing use of automatic machinery. It is clear that if one firm employs 10 or 15 per cent. more skilled labour than another, the wages bill of that firm will be higher than that of its rival, without any necessarily corresponding gain. As a matter of fact, the concerns that employ higher percentages of skilled labour do usually consider that they gain thereby, either in a higher quality of work, in fewer wastes, in a larger output, or otherwise. Hence it is desirable that each case in which the question of skilled *versus* unskilled labour arises should be judged on its own merits. The most important fact disclosed is that, over an area sufficiently large and varied to be absolutely typical and representative of the great iron and steel industry of the United States, the average wages paid over the two periods named were 10s. 1d. for skilled and 6s. 7d. for unskilled or common labour, which every employer at home may compare with his own rates, and thereby satisfy himself as to the extent of the real difference between the two countries.

COLONIES.—The question of the settlement in SOUTH AFRICA of time-expired soldiers and reservists is receiving considerable attention in view of the demand for labour which is accompanying the resumption of industry. The mine-owners and other large employers of labour are appealed to to give a preference to the soldier, who, after fighting their battle, is anxious to settle down in the country where he has made their interests secure. The disciplinary training which soldiers receive, without doubt makes them good overseers of native labour and good steady workers themselves. A supply of men with good characters can always be assured from the National Association for the Employment of Ex-Soldiers, and during the next six months some 40,000 to 50,000 Reservists would be ready to return to their normal occupations. In order to assist both those who want work and those who want workers, branches of this Association have been established at Johannesburg, Bloemfontein, Cape Town and Newcastle. An unofficial view of labour conditions in Johannesburg is given by a correspondent of *South Africa*. He says that from every coast town train-loads of returning refugees arrive daily. These men, for the most part, are labourers, artisans, and miners anxious to get back to their old employment and their old rate of pay. Durban and Cape Town, and Port Elizabeth, have had work to offer, but the work has been mostly of a make-shift character, and wages have been relatively low, excepting, perhaps, in Cape Town, but so far, at any rate, wages remain at their former level. Hundreds of working men are coming back every week, and there is a continuous demand for labour on all sides. On the mines the rock-drill men are making as much as before, and the drill sharpener draws his £7 or £7. 10s. per week. Engineers' wages range from £4 to £8 according to ability and the responsibility of the post. Storekeepers' billets are worth about £35 a month. Practically there is no change in wages for white men working in and about the mines. The pages of the *Star* well nigh overflow with advertisements offering employment to painters, masons, bricklayers, paper-hangers, glaziers, and shop-hands of every description. Of course, there is another side. Living expenses are undoubtedly more onerous than formerly, but this is due to causes of a purely temporary character. The working man, if he were single, could formerly live at a boarding house for 25s. to 30s. a week. His fare was rough, but it was wholesome and substantial. To live in the same way to-day will cost him £2. 5s. or £2. 10s. Foodstuffs are scarcer, owing to the denudation of the country and the enormous demand made upon the imported supplies by the army. Nevertheless, now that the railway service is becoming practically uninterrupted, goods are coming up rapidly, and prices in the course of a few weeks must inevitably fall. It is fair to suppose that in a couple of months the working man will not be paying much more for his food than he did before the war. The demand for house accommodation is enormous and the supply limited. The result is that small houses that were letting before the war at £6 and £7 a month are now being let for £9 or £10. There are all the premonitory symptoms of a building boom, and the score or so of trades immediately interested should be beneficially affected.

Regarding the attractions offered by the Dominion of CANADA to intending British settlers, and the practical assistance which the Department of Agriculture is prepared to afford them, an official statement was recently issued. The Department of Agriculture and Dairying endeavours by every means in its power to make the agriculturist and the dairyman succeed. The cool Transatlantic transportation problem was solved by it last season, by the introduction of cooled air accommodation on ocean steamers, and now cheese of softer and richer body than heretofore is being placed on the British markets. To further improve the quality of Canadian cheese the Government are now erecting consolidated model cheese-curing rooms in certain convenient centres. To-day in Canada there are some 3,000 cheese factories, with an annual aggregate output of 180,000,000 pounds of cheese, or an average of about 60,000 pounds per factory per annum; the new curing rooms will increase the value of the same quantity by \$1,000 per factory annually. To encourage improvement in farming, for the last six years upwards of 30,000 Canadian farmers have participated annually in a free distribution of grain seeds, 60 tons of seed being yearly distributed for the systematic testing of promising varieties of agricultural crops. The Government do not wait, for instance, for the development of "smut" in wheat, but just before seeding time send out to every known farmer and newspaper in the Dominion an article showing how to prevent the disease by treating the seed in a solution and so ensuring sound crops. Experts are periodically sent to Great Britain and Ireland to ascertain how readily to extend those markets for Canadian products, and when they return home they give the results of their investigations through the same media to flour- and oatmeal-millers who have a hand in preparing the products of grains for the home and foreign markets;

to the curers and packers of meats and the manufacturers of cheese and butter; to those engaged in the transportation and commerce on grain, hay, live stock, meats, butter and cheese, poultry and fruit, as well as the canners of fruit and vegetables, and the raisers of poultry and eggs; orchard cultivation, potato culture, how to rotate crops so as to secure the utmost grain from the soil without depleting its virtue, the analyses of soils and advice as to the best crops to sow to ensure the most profitable yield and to restore to the ground by natural means those chemicals of which the soil has been despoiled by a former crop; how to detect and destroy noxious grasses and weeds. These and a thousand-and-one other wants of a farmer, the dairyman, the orchardist, and every one else concerned are the constant care and solicitude of the Canadian Government, and are supplied freely for the asking to everybody interested throughout this vast country, without even the cost of postage, letters addressed to the department passing through the mails in Canada free.

INDIA.—An interesting account of the manufacturing industries of India is given in Mr. O'Connor's *Moral and Material Progress* for the past financial year. The domestic industries of India, such as weaving and spinning, pottery, brasswork, ironwork, and art work of many kinds, continue to be practised after ancient methods all over the continent of India, but Indian fabrics and products, made on a small scale by workers at their homes, have for years past been giving way before the cheaper cotton yarns and fabrics, and the iron or steel products of British factories. Meanwhile, without any protection, favour, or advantage other than is afforded by cheap Indian labour and by production of raw materials in India, an important manufacturing industry has been growing up, and steam-power factories are at work, among which those for spinning and weaving cotton, for spinning and weaving jute, for making paper, for husking and cleaning rice, for sawing timber, and for brewing beer, are the most important. Steam power is also largely employed in factories, on tea gardens and indigo estates. There were at the end of the year 1900-1 in British India and Native States 190 cotton mills (of which 16 did not work during the year), containing 40,542 looms and 4,932,600 spindles, and giving employment on an average to 156,000 persons every day. The capital invested is said to be more than £11,000,000. The industry dates from 1851, when the first mill was started. The 16 mills which were not worked during the year contained 690 looms and 240,000 spindles; and there were other mills in which no work was done for considerable fractions of the year, owing to the depressed state of industry. Eighty-four of the mills were in Bombay city and 54 elsewhere in the Bombay Presidency, which possesses 73 per cent. of the mills, 78 per cent. of the looms, and 72 per cent. of the spindles in all India. The number of jute mills in 1900-01 was 35, containing 15,242 looms and 315,264 spindles, and employing a daily average of 110,462 persons. All the mills, with the exception of one at Cawnpore, are in the province of Bengal, and most of them are in the vicinity of Calcutta. There were four woollen mills at work at the end of 1900, containing 22,986 spindles and 594 looms, and producing goods valued at £202,000 in the year; only two of the mills, those at Cawnpore and at Dhariwal, in the Punjab, are of great importance. There were eight paper mills at work in India, employing a daily average of 4,871 hands, and producing in 1900 about 46 millions pounds of paper, valued at £416,800. In 1900 there were 28 breweries at work, which produced during the year 4,951,700 gallons of beer and porter, 618,600 gallons less than they produced in the previous year. The largest brewery was at Murree, in the Punjab Himalayas, and the output of that concern was over 718,000 gallons in 1900. Among other large industries which are shown in the Indian returns for 1899, may be mentioned:—Bone-crushing factories, 19; coffee works, 23; cotton and woollen spinning and weaving establishments, not classed as mills, 27; dairy farms, 72; dye works, 6; jute presses, 142; lac factories, 151; oil mills, 208; pottery and tile factories, 146; printing presses, 928; rice mills, 256; rope factories, 21; silk filatures, 66; silk mills or factories, 33; soap factories, 31; sugar factories, 193; tanneries, 147; tobacco and cigar factories, 24; timber mills, 94. The total number of persons employed in the above industries was 695,895, distributed as follows:—Cotton mills, 156,039; jute mills, 110,462; woollen mills, 2,874; paper mills, 4,871; other industries, 421,649.

FOREIGN COUNTRIES.—In the German colonies in AFRICA, as in our own colonies, the labour supply is an important problem, and the regulation of this question, says a Foreign Office Report, is being gradually advanced. Some districts, which were formerly dependent on imported labour, are now, it is said, able to find a sufficient supply of native labourers, and in the East African plantations near the coast Chinese and Malay labourers are being superseded by Wanyamwesi natives. On the plantations in the Cameroons natives are now being employed instead of the blacks formerly imported from Togoland and other places, and attempts are being made to introduce the system of piece-work labour in the Cameroons and German East Africa. In SAMOA and GERMAN SOUTH SEA PROTECTORATES the solution of the labour problem is found more difficult. The British Consul at Munich reports that the new regulations for the GERMAN EMPIRE for the shortening of Sunday labour are generally carried out, except in the case of some large breweries, flour mills and brick works. In Bavaria the hours of labour have remained the same, except in the case of some textile industries, when they have been shortened. There exist three labour colonies in Bavaria, Simonshof, Herzogsägmühle, and Schernau, each for 100 persons. These colonies furnish agricultural or industrial labour to the unemployed, without distinction of class or religion, and are especially adapted to persons who have been in prison. The wages are lower than the rate of the district, and for the first fortnight no wages are given. Only Bavarians are eligible to work in these colonies, and, on entering, they are obliged to sign an agreement to obey the rules of the establishment. The founding of a fourth colony in Southern Bavaria is under consideration.

In the UNITED STATES, the strike in the anthracite coal-fields continues, and the consequent interruption of work increases. The owners met with great difficulty in their attempts to reopen the mines, owing to the engineers and pump-hands going on strike as well. In well-informed circles, however, the idea prevails that the strike will not gain further ground.

SCIENTIFIC AND TECHNICAL DEPARTMENT OF THE IMPERIAL INSTITUTE.

THE COAL RESOURCES OF INDIA.

In a recent lecture delivered before the Indian Section of the Society of Arts, Professor W. R. Dunstan spoke of the importance of a cheap supply of coal to the prosperity of a country. India possesses a practically inexhaustible supply of coal, and in recent years there has been a rapid development of the coalfields. In 1880 the output of coal had just exceeded 1,000,000 tons, while in 1900 the output from Indian collieries exceeded 6,000,000 tons, of which the Bengal mines contributed nearly 5,000,000 tons. The import and export trade is quite as satisfactory, for while between 1885 and 1895 the imports into India varied between 600,000 tons and 800,000 tons per annum, in 1900 they had decreased to 127,318 tons. In 1892 the exports amounted to 15,620 and in 1900 to 541,445 tons. Perhaps the most healthy sign of the industry is the increase in the home consumption, and there is little doubt that with the completion of the railways in a few years' time there will be a rapid development of the fields throughout India and the industries connected therewith.

The coal measures of the Indian Peninsula are, geologically, of Permian-Triassic age, and are known as the Upper and Lower Gondwana Series. Those of the eastern peninsula area are either Tertiary or Cretaceous, but except in Assam the Cretaceous beds are generally unproductive of coal. The total area of Peninsula coalfields was placed many years back at 35,000 square miles, and, as the seams are often of extraordinary thickness, it is clear that India has a source which will supply all her needs for an indefinite period.

Provincial coalfields.—BENGAL.—The principal coalfields of this province are those of Karharbari (Giridih) Raniganj, Jheria and Karanpura, and in 1900 there were 238 collieries. The Karharbari field has an area of eight square miles and was estimated by Dr. Saise in 1880 to contain 136,000,000 tons of coal. The most important seam is the lower seam, which has an area of about seven square miles and a thickness varying between 12 and 30 feet. The collieries are served by the East Indian Railway Company, which also possesses a part of the field.

The RANIGANJ-BARAKAR field is about 130 miles from Calcutta and extends westward along the valley of the Damuda river, covering an area in the exposed portion of 500 square miles. The amount of coal it contains is estimated at 14,000,000,000 tons. The seams are of great thickness.

The JHERIA field is 16 miles to the west of the Raniganj, and is connected with the East Indian Railway by branches terminating at Jheria and Katrasgarh. The field has an area of about 200 square miles and the amount of coal it contains is estimated at 864,000,000 tons.

Two miles west is the BOKARO field, which covers 220 square miles, and is estimated to contain 1,500,000,000 tons. Further west along the Damuda valley are the Karanpura fields. The north field has an area of 472 square miles and is estimated to contain 8,750,000,000 tons, while the south part contains 75,000,000 tons. Neither the Bokaro nor the Karanpura fields have been worked. Many other fields of less importance occur in Bengal. The coal of Bengal contains on an average 60 per cent. of fixed carbon and 10 per cent. of ash. The soft coals of the Raniganj-Barakar series do not produce a satisfactory coke, but those of Giridih and Jheria, when washed and coked in a closed oven, furnish a hard coke containing 10 to 12 per cent. of ash.

In the Central Provinces in 1900 there were eight collieries at work, and the output amounted to 172,842 tons. The principal fields are the Mohpani and the Warora coalfields. The Mohpani field is rather less than 100 miles from Jabulpore and 322 miles from Allahabad. The field has been worked for many years. Its area is small and there is a correspondingly small output. The Warora field has an area of 420 acres and is estimated to contain 20,000,000 tons. The seams vary in thickness up to 13 feet. Situated in the Wardha valley, in the vicinity of the Warora fields, are the coal-bearing strata of the Ghugus and Wun, at present unworked. Warora is 120 miles from Nagpur and 500 miles from Bombay by rail.

In Central India the only field at present worked is that of Umaria, which lies in the eastern end of the province at a distance of 34 miles from Katni on the Great Indian Peninsula railway. The area is about 3 square miles, and is estimated to contain 28,000,000 tons of coal. Other fields, such as Sohagpur, Korar and Johilla, are of large area and known to contain thick seams of valuable coal.

In the Nizam's Dominions practically the whole of the coal is obtained from the Singareni field, where, in 1900, were five collieries at work, producing 469,291 tons. It is situated in the Godavari valley, has an area of about 8 square miles, and there are several seams, one of which is over 40 feet in thickness. A considerable trade is done both with Bombay and Madras.

In Rajputana there is one mine which has worked a thick deposit of brown coal during the past four years at Palana in the Bikanir region. The output in 1900 was 9,250 tons. In Baluchistan there were nine collieries at work in 1900, which work thin seams of tertiary coal. At Khost the seams are from 6 inches to 2½ feet thick. In the Punjab in 1900, two collieries were at work producing 74,083 tons. At the Dundot collieries a seam from 2 to 3 feet thick is worked. The coal is probably tertiary and occurs in many localities of the Salt range. At the extreme east of the range is situated the Bhaganwala field, which is estimated to contain 1,000,000 tons of coal. In Assam large deposits occur of both tertiary and cretaceous coal. The most important mines are those of the Makum field in the Lakimpur district. The seams here are from 75 to 100 feet in thickness and are estimated to contain 18,000,000 tons of coal. The coal contains only a very small percentage of ash and is probably the best steam coal that India produces.

The Cherrapunji field is situated on a ridge of the Khasia hills and covers an area of something less than a square mile and is estimated to contain about 1,000,000 tons. The production of coal in the whole province in 1900 was 216,736 tons. In Burma in 1900 there was only one colliery at work, known as the Letkokbin mine, and situated on the west bank of the Irrawaddy 60 miles from Mandalay. The seams are from 4 to 5 feet thick, and the coal is compact and hard. In 1900 the production was 10,228 tons.

In regard to the quality of Indian coal the lecturer made the statement that, taking into account all the defects of Indian coal, it may be said to be 27 to 30 per cent. inferior to average British coal of the same type. Where cargoes of the best Indian coal have been put on the foreign market they have competed successfully with English and Japanese coal, but in some cases cargoes of inferior coal have been exported which has been to the detriment of foreign trade. From reports of steamship companies, it appears that Indian coal is not generally suitable for use in mail steamers, as it is impossible to obtain a satisfactory result in point of speed, but in case of cargo boats, where speed is a matter of less importance, it is used to great advantage owing to its small cost compared to English coal. For such, as well as for steamers plying in the Indian Ocean, Indian coal is always used between Suez and Singapore. Assam coal is reported on the most favourably, and the Desherghur of Bengal coals. Until 1897 Welsh coal was chiefly used on Ceylon railways, but, owing to the tremendous increase in price, Indian coals were largely used and, though they gave much trouble, owing to the amount of ash, a considerable reduction was made in working expenses. One of the chief steamship companies states that, from general experience of Indian coals, the consumption is 25 per cent. above that of Welsh coal.

Indian coal could only be used in admixture with other superior coal and was generally used in proportion of two-thirds of Welsh coal to one-third of Indian, and the general results have been disappointing, Indian coal being far worse in practical value than any with which they had had to deal. The coal is generally greatly depreciated by the large amount of dirt that is mixed with it, but it has improved in quality and is likely to hold its own in the supply of the Eastern market. On the whole the information as to the value of Indian coal for steamship and locomotive purposes obtained from the principal consumers is fairly satisfactory and encouraging. It is evident, however, that better supervision must be exercised in order to secure for these purposes the most suitable coal, and greater care taken to obtain a standard quality.

In 1900, nearly 90,000 people were employed in coal-mining, the average pay for underground work being about 1½ rupees a week. Native labour is universally employed, and the coal is generally cut by hand. The mines are owned by joint-stock companies, private individuals and the State—generally through the railway companies. Indian coal at the pit's mouth is probably lower in price than in any other country, often reaching two rupees a ton. The local wholesale selling price of Bengal coal was, in 1900, 4s. 5d. a ton, as against 4s. 2d. in the previous year. The wholesale price for imported coal in Calcutta averaged 32s. 1d. per ton. The bulk of the labour consists of Bauris and Sonthals. The Karharbari coalfield is mainly worked by three companies—the Raniganj Coal Association, the Bengal Coal Company, and the East Indian Railway. The system of working is similar all over Bengal. The working hours are from 6 a.m. to 6 p.m., and sometimes later when extra work is required. Only four days a week real work is done, and the consequence is that the output per colliery is much less than in England. All the miner's family work with him. The coal is mined on the bord and pillar system. The larger proportion of the labourers cultivate during the rainy season, and work at the collieries only in the cold season from about October to June. Coal-cutting is paid by contract at so much a tram or bucket, and the price generally varies from 7 to 8 annas per ton for large, and 1½ to 1¾ annas per ton for small coal. The coal is hand-picked into four kinds. Steam coal is larger than 2-inch cube, rubble larger than ¾-inch cube, smithy down to ½-inch cube, and all smaller than that is called slack or dust. At Warora, Central Provinces, where 100,000 tons per annum are wound by direct-acting engines out of two shafts, 200 feet deep, the system nearly approaches the English. No women work underground, and work is constant from Monday morning to Saturday night. The work is divided into three shifts of eight hours each. The seams which are from 8 to 12 feet thick are worked by driving galleries or bords and headways, 12 feet wide, 6 feet in height, leaving the roof coal and pillars 40 feet square. The colliery consists of six pits varying in depth from 100 to 250 feet. All the pits are supplied with sidings, and connected with the Wardha State Railway by a branch line.

In regard to railway transport, the Committee of the Indian Mining Association consider that the transport and distribution facilities at present provided are distinctly unsatisfactory, the chief defects being roughly classified under three heads:—(1) A serious and constant deficiency of rolling stock on the principal coal-carrying railway—the E. I.; (2) heavy railway freight charges; and (3) inadequate and inefficient loading facilities in Calcutta—the port of shipment. During the last six years the coal carried by the E. I. railway has nearly doubled, being 2,926,330 tons in 1895, and 2,874,697 for the first half of 1901, while the number of wagons has increased from 9,468 to 14,759, and the carrying capacity has been more effective by something like 50 per cent., which appears to be fully adequate for the average trade. The rates also appear to be lower than those of most other countries, and only one-third the English rates. The last point dealt with was the utilization of the fine coal. Several varieties of Indian coal are liable to disintegrate, and much that is now wasted might be used in the manufacture of patent fuel or water gas, and it is to be noted that the bituminous character of much of the Indian coal would seem to render it particularly suitable for the production of water gas. In concluding, the lecturer drew attention to the importance of railway communication being opened up with the undeveloped coalfields of Western Bengal, the Central Provinces, and Central India, and to the great advantage it would be to Madras and Southern India where coal is scarce or non-existent, if communications were provided between this region and the coalfields of Western Bengal, and the Central Provinces.

[This lecture has been issued as an official publication by the India Office, and may now be purchased at the Indian Section, Imperial Institute, or of Mr. EDWARD ARNOLD, 37, Bedford-street, Strand, W.C. (Price, 1s.)]

“SAKI” BREWING IN JAPAN.

An interesting account of the brewing and composition of “saki,” the national drink of Japan, appears in the United States Consular Reports for March, 1902, of which the following is a short resumé:—

The manufacture of “saki” includes two distinct processes: the production of “koji,” which is employed in much the same way as malt in beer brewing, and the combination of the “koji” with steamed rice and water under conditions favourable to induce fermentation.

In the manufacture of “koji,” rice, husked but not cleaned, is pounded in a wooden mortar by a heavy wooden hammer which is alternately raised and allowed to fall upon the rice. The pounded mass is separated into three portions, the whole grains, the broken grains, and the bran; the former, which is used for the best “koji,” after being thoroughly washed and allowed to soak, is steamed, thus causing the starch of the rice to become gelatinised. The mass, now called “mi,” is spread on mats to cool and then mixed with a yellowish powder called “tane,” which consists of the spores of a fungus. The mixture is allowed to remain for thirty-six hours at a temperature of 25°C. and is then collected into heaps and left from four to five hours, during which time the temperature rises considerably. The mass is now spread on trays to cool and then worked with the hands.

The preparation of the “koji” thus briefly described is often undertaken in independent factories.

The chemical analysis of the “koji” shows that most of the starch contained in the rice is converted into dextrose.

Certain proportions of steamed rice, “koji” and water are now mixed to a smooth and even consistency and put into a large vat in which the heating of the mash is conducted; for this purpose a wooden cask containing boiling water is suspended in the liquid and kept moving so as to ensure an even distribution of heat. After half-a-day this cask is taken out and replaced by another; in this way as many as ten or even more of these heaters are employed. A frothy fermentation is induced by the increased temperature and is permitted to continue for seven days, after which time the liquid is transferred to shallow pans and allowed to cool.

The product at this stage of the manufacture is called “motoh.”

Equal quantities of “motoh,” steamed rice, and water, with one-fourth of “koji,” are mixed and stirred at intervals during two to three days. Steamed rice, “koji,” and water in certain proportions—the quantity of the latter depending on the alcoholic strength required—are now added and fermentation allowed to proceed until the froth subsides. After the lapse of a few days the fermented liquor is filtered under pressure through hempen bags and put into casks until the matter in suspension has subsided.

The clear “saki” is difficult to preserve and, for this reason, has to be heated to 49°–54°C. before it is stored in sealed vats.

The composition of the "saki" is shown in the following table:—

	Per cent.
Alcohol	11.14
Glycerin, resin, and albuminoids	1.992
Fixed acids13
Volatile acids02
Water (by difference)	86.718
Total	100

SUGAR-CANE CULTIVATION IN MADRAS.

A considerable amount of interest is being shown in various parts of India at the present time in the possibility of profitably extending the cultivation of the sugar-cane and of manufacturing sugar for export. In this connection a *Bulletin* recently issued by Mr. C. Benson, Deputy-Director of Land Records and Agriculture for Madras, gives an interesting historical account of the introduction of the various exotic canes now grown in Madras, and of the yield of sugar obtained from them, and from those indigenous to the province, after about 60 years of cultivation. The area of land under cane in Madras was greatly extended for the first time about 1836, when the import duties on East and West Indian unrefined sugars were equalised in England. In this year, on the initiative of Surgeon Wright, the Madras Government obtained a supply of cuttings from Mauritius, which were in the course of time distributed to planters throughout the province and supplemented by further imports at various times. The Mauritius cane thus introduced, together with several indigenous varieties, constitute almost the whole of the sorts now cultivated in the province. The indigenous varieties commonly grown are the purple or red cane, and a small white reed, the latter being especially popular, and constituting in general about one-third of the whole Madras crop. The introduced varieties are white or yellowish canes, and probably also include the common striped kind which Mr. F. N. Gill regards as derived from the Otaheite Ribbon cane of Mauritius and the West Indies.

There existed, until the results of the present investigations were published, no information regarding the yield obtained from these various canes, so that no selection has occurred based on analytical data, nor has any study been made of their relative resistances to climatic, fungoid, and other disturbing influences. Mr. Benson calls attention to the urgent necessity of planting experimental plots for the investigation of these points, and for the determination of the kind of soil best suited to the plants, the necessity or otherwise of irrigation, and the detection of any downward tendency in the yield of sugar obtained.

The analyses of the juices were made by Mr. C. L. Royle, and a selection from the results obtained is given below:—

Variety of Cane.	District.	Juice obtained. per cent.	Sucrose. per cent.	Glucose. per cent.
White . . .	Coimbatore . .	68-72	17 to 20	.75 to 1
	Kurnool . .	66-67	10.3 to 13.8	1.6 to 1.98
	Godavari . .	62	12.6 to 16.7	.29 to .91
Striped . . .	Coimbatore . .	68	15.0 to 17.5	1.08 to 1.15
	Kurnool . .	62-68	10.8 to 16.8	.95 to 1.8
	Godavari . .	68-70	9.57 to 17.88	.71 to 1.4
Purple . . .	Coimbatore . .	55-62.5	15.7 to 18.4	.82 to 1.31
	Kurnool . .	60	10.16 to 11.74	.87 to 2.3
	Godavari . .	62-65	8.61 to 16.34	.44 to .95

In the *Bulletin* further particulars relating to the kind of soil on which the crops were grown, and the method of cultivation, are given which need not be reproduced here, but attention may be directed to the large yields of sugar obtainable from many of these canes, which compare very favourably with the amounts obtained in Australia, the West Indies (IMP. INST. JOURNAL, VII., pp. 155, 210), and in Hawaii, where, even with a very carefully organised system of cultivation, the usual yield is about 17 to 18 per cent.

MINING AND CONCENTRATION OF CORUNDUM IN ONTARIO.

The existence of corundum in Ontario has been known for some twenty-four years, but it was not till the year 1896 that the corundum-bearing rocks were accurately surveyed. The prevailing rock is gneiss, composed chiefly of hornblende, biotite, and felspar, which is traversed by dykes of felspar and mica, and, in some cases, nepheline syenite. These dykes carry corundum, as well as small quantities of magnetite, pyrites, garnet, etc. The largest deposit of corundum discovered in Ontario, and the only deposit which has yet been economically worked, occurs in Raglan township, Renfrew county, in a broad dyke of almost pure felspar, which outcrops at intervals on the southern face of a high hill. The corundum itself is in the form of hexagonal crystals, which vary in size from half-an-inch to five or six inches in length, and are scattered through the felspar. The colour is usually of a brownish or greenish shade, and, whilst in one place the corundum may be concentrated in quantity, only a few feet away the felspar may be quite barren. This concentration apparently follows no definite law. The property was secured by the Canada Corundum Company in 1900, and during the year work was begun in developing the deposit and in constructing an experimental plant for the concentration of the ore and the preparation of raw corundum for market. Since then the process has been gradually improved, and the following is a description of the method at present in use:—Mining operations are exceedingly simple, and merely consist in stripping the dyke, drilling being done by hand, and dynamite being used for blasting. The ore is roughly sorted at the mine, and the picked ore, containing, probably, an average of 10 to 15 per cent. of corundum, transported by wagon to the mill. The concentrating problem presented by the ore is the separation of the aluminium oxide, with a specific gravity of about 3.9, from the felspar gangue with specific gravity of 2.4 to 2.5, and the elimination of such impurities as magnetite and pyrites. Water-power is used for working the concentrating machinery, and about 25 tons can be treated per day. The ore is fed by hand into a No. 2 Gates gyratory crusher, with a rated capacity of 12 tons per hour, which is, however, much less for this mineral, on account of the extreme hardness and tenacity of the corundum and the toughness of the felspar, which is finely crystalline and devoid of cleavage. In crushing, the corundum and felspar do not part readily, and a clean separation cannot be effected unless crushed to at least a 12 mesh. After the first crushing the ore, which is made to pass through a 1½ inch ring, is crushed wet between rolls to ½ inch size. It is now separated into three sizes, by means of a trommel fitted with 4-mm. and 8-mm. punched steel screens. The 4-mm. size is further separated into 1.5 mm. and 2.5 mm. sizes. Larger sizes, in each case, go to gigs, which concentrate the corundum. This is re-crushed, and further subjected to the sifting operation, the final products being 1 mm. and 1.5 mm. sizes. By means of concentrating tables, a fairly clean magnetite corundum is obtained. These concentrates are dried on steam driers and passed under an electro-magnetic separator, to

free them from magnetite. The final operation consists in sizing, and the products are, approximately, 50 per cent. in sizes 12 to 24 mesh, 45 per cent. in sizes 30 to 80 mesh, and 5 per cent. of fines. Sizes above 24 mesh are re-washed, to remove the remaining felspar, dried, and again treated under the magnetic separator, and re-sized. The finished corundum is put into 200 lb. sacks, ready for market.

THE COPPER-MINING INDUSTRY IN THE CLONCURRY DISTRICT.

Copper ore was discovered in the Cloncurry district in the year 1880 and was worked and smelted by a Glasgow Company between 1883 and 1887, after which year work was suspended, and it is only in recent years that attempts have been made to re-establish the industry.

The rocks, in which the copper is found, belong to the older Metamorphic Series and form an extensive area of stony ridges and rough hills at the heads of the Cloncurry, Leichhardt and Burke rivers. These rocks break through the later formed Lower Cretaceous strata which form the plains and downs of the greater portion of Western Queensland. The copper-bearing rocks are of Silurian age and consist of steeply inclined—as a rule, almost vertical—beds of altered sedimentary strata, being made up chiefly of quartzites, greywackes, slates, schists and crystalline limestone. The beds have been bent into sharp folds by forces acting in a general east and west direction, the same forces having determined the direction of the majority of the lines of hills which, as is well known, is north and south. The copper deposits are distinctly bedded and are not fissure lodes. From the surface, down to the permanent water level, the copper occurs as blue carbonates, copper glance, and oxides in ores of all degrees of richness, from the earthy ferruginous and siliceous varieties, to masses of practically pure ore. Below the water level, the copper occurs as thin seams and impregnations of cupiferous pyrites in the slates. This leaching out and concentration of the mineral accounts for the phenomenally rich ores which are found outcropping all over the Cloncurry district. The deposits are generally very irregular both in quality and extent.

The *Great Australian Lode* consists of three, each of which has been worked at the outcrop. The matrix is a brownish quartzite enclosing small pieces of metallic copper and thin veins of green carbonate. The ore can easily be picked to a high percentage. The lode appears on an average about 10 feet wide and is generally nearly vertical.

The *Hampden Mine* consists of a series of shallow shafts and trenches above the permanent water level, extending along a belt of copper-bearing slates some 200 feet in breadth for about 40 chains in length. The beds are vertical and their general trend is about 15 degrees west of north. The ore is chiefly red oxide, and the lode material is a soft white kaolin derived from the decomposition of the felspathic slates. The ore is graded into three classes containing 40 per cent., 13 per cent. and 6½ per cent. of copper.

The *Duck Creek Lodes* appear to be similar to those already mentioned. The ore is either oxide or carbonate. A bulk assay of the ore gave 16.36 per cent. of copper and 4 dwts. 13 grains of silver. Many other outcrops are known to occur and some work—mostly prospective—has been done towards their development. Since the district was surveyed in 1881 very little has been done to prove whether the outcrops contain valuable ores at a lower depth. The discovery of the Hampden Lode is the only item of any importance, and the splendid manner in which this mine has opened out leads to the hope that other outcrops, when prospected, will be found well worth systematic development.

GENERAL NOTES.

CITRONELLA OIL FROM JAVA.

The recently issued bi-annual report on essential oils of Messrs. Schimmel and Co. draws attention to the fact that the cultivation of citronella grass, and the distillation of this volatile oil, has recently been undertaken in Java. No particulars are given as to the composition of the oil, but it is said to be of much finer quality than that now produced in Ceylon, where it is inferred the cultivation and distillation of the plant are less rationally carried out. The value of this Ceylon industry may be estimated from the fact that 1,430,168 lb. were exported last year, valued at about one shilling per lb. The quality of the Cinghalese oil has greatly improved in the last few years, adulteration being now very rare, and it is difficult to see how a finer oil can be produced in Java at the present unremunerative price.

CINNAMON OIL.

This valuable volatile oil, now chiefly produced in Ceylon, has recently been examined in the laboratories of Messrs. Schimmel and Co., and its composition ascertained. In addition to the principal constituents *cinnamic aldehyde*, *phellandrene* and *eugenol* (the odoriferous constituent of oil of cloves) the following substances have also been found: *pinene*, the characteristic constituent of turpentine, *cymene*, *caryophyllene* (also present in clove oil), *benzaldehyde* (oil of bitter almonds), *linalool* (a constituent of lavender oil) and *cumic* and *nonyllic aldehydes*. There are also probably present *hydrocinnamic aldehyde* and *linalyl isobutyrate*.

An *Automobile Fire Engine* is being brought out, in which the power that drives the pumps can alternatively be applied to propel the engine through the streets to the place where its services are required. A machine of this type has been in successful use for some two years in Mauritius; but in the present instance a further advance has been made by the adoption of liquid fuel, which seems to present distinct advantages for this kind of work, not only on account of the ease with which it can be manipulated, but also because the amount that can be stored in a given space will yield considerably more power than the same amount of coal. Steam can be raised from cold water in a very few minutes, and if, as is frequently done, the water in the boiler is kept warm while the engine is standing in the fire station by means of a ring of gas jets, the petroleum burner can get up a full head of steam (120 lb. per square inch) in one minute. The vehicle is controlled from the front by a throttle valve, reversing lever, and foot brake, and, although its 30 horse-power engines enable it to attain a high speed and its weight complete approaches three tons, it can be stopped dead in a few yards.

The Carrying Trade of the Kingdom.—The Liverpool Steamship Owners' Association have just prepared a very interesting series of tabular comparative statements with respect to the carrying trade of the United Kingdom during the ten years 1891-1900, showing the part of that trade carried in British and foreign vessels, distinguishing the trade with foreign countries and that with British possessions, and also distinguishing vessels with cargo and those in ballast. The figures have been obtained from the "Annual Statements of the Navigation and Shipping of the United Kingdom." The tonnage of vessels with cargoes trading to foreign countries in 1891 comprised 36,428,937 British and 15,816,415 foreign, while in 1900 the figures were 42,780,284 tons British and 26,566,403 tons foreign. The annual average for the ten years was 40,860,575 tons British and 18,887,284 tons foreign. The percentage of British decreased from 69½ to 61½, while that of foreign increased from 30½ to 38½, the annual average percentages for the whole decade being respectively 68 and 32. The vessels trading from the United Kingdom to British possessions with cargo were of 9,105,416 tons in 1891 and 9,551,871 tons in 1900, while foreign ships were of 963,456 tons in the former year and 959,586 tons in the latter. The annual average percentage of British increased in the ten years from 90½ to 91½, while that of foreign decreased from 9½ to 8½.

WEST INDIAN TIMBERS.

(By JOHN T. REA, F.S.I., Surveyor, War Department.)

The following information has been compiled by the author as the result of four years' residence in the island of St. Lucia, West Indies. Much is original, but a great portion has necessarily been obtained from the brief and scattered notices of other writers. It is believed, however, that this is the only attempt that has been made to prepare anything like a full summary of West Indian timbers. Descriptions of a hundred of the more important varieties are here given, in the hope that many of these valuable woods may receive fuller recognition of their value, by consumers in the United Kingdom, than has hitherto been the case. It is only from the large forests of British Honduras and British Guiana, which are on the mainland, that copious supplies of cheap building timber can be obtained. There is, however, a plentiful supply of good stuff in the West Indian Islands, two-thirds of most of them being still in virgin bush and forest. For example, the Layou and Sara Flats, or Crown Lands of Dominica, have an area of 40 square miles, and contain a mine of wealth in timber; while in Trinidad there are at least 300,000 acres of forest land. Combined, the West Indies represent an area of 100,000 square miles. There are some very large trees, but, generally speaking, they are of moderate size, and only comparatively small scantlings can be cut. Some of the woods are useful for building and engineering works, but they are suitable principally for furniture, panelling, cabinet, and other fancy work. The immense variety of small articles such as knife-handles, knobs, buttons, etc., which are now manufactured from choice grained woods, opens a ready market to many West Indian timbers, the beauty and appearance of which cannot be surpassed. Gum- and resin-yielding trees abound; and commercially valuable fibres may be stripped from quite a number of them. The barks, leaves, and berries of others furnish well-known drugs, dyes, and spices. The economic uses are therefore very great, so that these colonies afford a fair field to the enterprising capitalist. Owing to the fact that all the best timber is in the inland forests, with few convenient rivers for floating it down, and also owing to the defective character of these means of communication, and the absence of sawmills and machinery for their treatment, the native woods have until lately been only available in small quantities. Circular and other rapid saws have recently been added to the plant of most of the Public Works yards, so that some of these disabilities are being remedied.

The subject of Forest Conservancy has been considered many times by governors, colonial engineers, surveyors, wardens, botanists, and by officers of the Crown Lands, but a continuous definite policy does not appear to have been ever decided upon. This is to be regretted, as much destruction has occurred through fires, chiefly caused by wanton squatters. A forest of West Indian cedar would at the present time be a source of wealth to any man who was lucky enough to possess it. The same may be said of mahogany and other native woods. Yet it is but on rare occasions that trees are planted, and then only in twos and threes in some garden. This is because the owner of the land fears he shall never see the benefit, on account of the length of time they take to grow. Such reasoning, however, is very short-sighted. A good plantation of cedar or mahogany will, within ten years, enhance the value of lands by 50 or 60 per cent., if tended with a modicum of care, and the State should take steps to give practical illustration of this on lands suited to the purpose, at the hands of properly instructed officers.

SEASONING.—Timber may be cut down at any time of the year, but it is preferable to do so during the dry season, and before the wet months commence (on the same principle as felling at home in the winter, when the sap is down), as the trees then become extra sappy with the absorption of the moisture. Native wood-cutters have an idea—which may be laughed at, but is believed locally to be right—that if the trees are not felled during certain phases of the moon, the timber is almost certain to be attacked by woodworms or borers, and they prefer, generally, the months of February and March for hewing. Practically this has been found to be correct, and the period between three days after new moon and three days before full moon is the time selected.

A very important precaution adopted in Australia, which might be applied to the woods of other colonies, is that of "ring-barking" (or severing the bark right round the stem down to the wood) all trees at least three months before they are felled, or, as it might be called, "killing them standing." Indeed this practice is of high antiquity, and is mentioned by Vitruvius. The tree, in its perpendicular position, is thus more rapidly drained of its sap and juices when once the bark is cut through to the wood, so that they descend by the natural channels, instead of slowly percolating into the woody tissues, and rotting the log when left in a horizontal position. The trees should be allowed to stand a twelvemonth after the operation, which not only increases the density and strength of the timber, but at the same time seasons it.

Trees should be squared and cut up immediately after felling, and the wood should not be worked for six months, or even a year, during which period it ought to be stacked, and well covered, in sheds, with a free circulation of air round the several pieces, otherwise it will warp and twist when used. Owing to the readiness with which it is attacked by ants, all wood in store, especially unwrought spars, should be stowed away so as to admit of easy and frequent inspection. This liability to attack is greatly increased if the bark be left on.

ATTACKS OF ANTS, WORMS, ETC.—With the exception of some of the bitter and hard woods, most of the timber is liable to the attacks of "white ants," commonly called wood-lice, and this is especially the case with white pine and white oak. Mr J. H. Hart, F.L.S., Superintendent of the Royal Botanic Gardens, Trinidad, declares that these insects *do not attack sound wood*, but only that which has first been permeated by the mycelium of a fungus, which has probably found entrance to its tissues at some point of injury, as, for example, at any spot which is rendered damp by leakage from the roof or other cause. The insects thus follow the attack of the fungi, and as they eat away the heart, an apparently healthy piece ultimately becomes nothing but a mere shell, which suddenly collapses without warning. The writer has known beams and legs of tables insidiously hollowed out in this manner, there being no visible indication outside. The true ants which attack timber march in columns during daylight, and not in covered runs as do the termites. The former, as a rule, maintain their nest, made of clay, in some neighbouring tree, in a position sheltered from rain, and often travel to a considerable distance from the place where they are working at the destruction of timber.

To escape their depredations the builder must, therefore, first of all prevent the attack of the fungus by insisting upon conditions ensuring perfect ventilation and dryness, which are well known to be antagonistic to the growth of this form of vegetable life. One cure is said to be a treatment with calomel, or with molasses and arsenic, but the pests often reappear. Kerosene is effective while its smell remains. Creosoting with bone oil is said to be the best preservative against white ants, but on account of its odour it is only adapted for outdoor work, and it is difficult to apply to dense tropical timbers. The appearance of the ants should be watched for, their "traces," or little mud tunnels, followed up, and the whole nest destroyed. The only permanent antidote is to employ some of the bitter and hard woods which these insects avoid, such as quassia, or bitter ash. Notwithstanding the supposed immunity of greenheart, it is found in St. Lucia to be subject, in salt water, to attacks from worms, probably the *teredo navalis*, or ship-worm.

CLASSIFICATION.—It is very difficult to determine the classification of West Indian trees, as the names of perhaps the same tree vary in different islands, while the variations of patois-titles also lead to much confusion. In many instances it is also difficult to substitute English

equivalents for the patois, or corrupt French or Spanish names, while the scientific titles of other trees have not yet been determined. It is thought, however, that the following nomenclature will be generally accepted.

PRINCIPAL TIMBERS OF THE WEST INDIES.

1. ACOMA (*Mimusops*, *Sp.*). Also called Mastic. Found in most of the islands. A large timber tree, with wood hard, dense, and durable, and of a light brownish colour. Excellent for using in the ground, as in posts, where it will last without protection for years. It is likewise fit for cabinet work, and for house building generally. Native workmen sometimes make their planes of acoma. Weight, 66 lb. per foot cube.

2. ADEGON (*Ardisia*, *Sp.*). Grows in Dominica. A large tree, 4 or 5 feet in diameter, employed for all purposes, such as boards, planks, mill work, house work, shipbuilding, shingles, etc. Lasts well in water.

3. ALMOND, or Amandier (*Terminalia catappa*). Found in most of the islands. From its appearance the wood is styled "native mahogany" in St. Lucia, although no real mahogany grows in that island. It possesses similar characteristics, attains a large size, and is used for furniture and housework. There are two sorts of the wood, light brown and dark brown, the latter being reddish and streaky. Weight, 56 lb. per foot cube. There is another kind of wood spoken of by the natives as Mahault-Garnier, and likewise known by them as "mahogany."

4. ANGELIN (*Antira inermis*). Grows in St. Lucia and several other islands. A large tree, 40 to 50 feet high, and 3 to 5 feet in diameter, producing fine timber when full grown. Sometimes referred to as the Cabbage tree. There are two kinds, red and white. It is a strong hardy wood, lasting well in water, and is therefore suitable for piles, bridges, etc., as well as for framing houses, mill rollers and naves of wheels. It has been used for treads of steps in St. Lucia. The grain is brown and streaky, and very like cocoanut. Weight, 58 lb. per foot cube. The bark, known in England as "worm-bark" or "bastard-cabbage bark," is a narcotic drug.

5. ANNATTO, or Roucou (*Bixa orellana*). Found in most of the islands. A low shrubby tree, rising to 12 feet high on the banks of rivers, from the prepared seeds of which the celebrated reddish-yellow annatto dye is extracted. The seeds and leaves are likewise employed in medicine as an astringent and febrifuge. The stem has fibres, which in Jamaica are converted into ropes. The wood is soft, and the friction of two pieces will produce fire.

6. AQUATAPANA (*Watercaine*). Found in Trinidad. The tree is from 18 inches to 3 feet in diameter, and of very straight growth. The wood is curious, and susceptible of a high polish. It is useful and durable, and said to last longest under ground. Its local value is about £8 per ton.

7. ARAMATA. Grows in the Itoori-bisci creek, Essequibo river, British Guiana. This is a comparatively common tree throughout the colony, and flourishes on sandy soil. The wood is hard and dark-coloured, being used for boat-building, house-framing, and sometimes for cabinet work. Its average height is about 80 feet, and it can be had to square 12 inches, free of sap. A decoction of the bark is used by the Indians to wash their dogs to destroy vermin.

8. ARRISOUROO, from the upper Essequibo river, British Guiana, growing plentifully in low situations near the river. The average height is 80 feet, and it will square 14 inches free of sap. The wood is of a dark yellow colour, and has a very bitter taste. It lasts long when exposed to the weather, and is not attacked by worms; for these reasons it is well adapted for planking vessels, etc. A decoction of the bark is used for dressing ulcers, and the sap as a remedy for ringworm.

9. BALATA (*Mimusops globosa*). Named Bullet tree, or Burueh, in British Guiana; also called Bully wood. This is a lofty tree found in most of the islands, and generally on hills in the forests. The trunk sometimes attains a diameter of 7 feet, and squared logs can be obtained 40 feet long. It grows plentifully in Berbice, where it may be found 5 feet in diameter and 100 feet high, yielding logs 42 inches square free of sap. There are three varieties of balata—red, white and black; all three are very good, but the red is the best. The wood is dense, hard, and heavy, having a sour smell when freshly cut; it is most durable when free of sap, and is suitable for most outside work, harbour work, and all carpentry and joinery, but it warps much in seasoning and cracks when exposed to the sun. It is used for telegraph posts, for mill rollers and beams in old sugar factories, and for skittle alley platforms, fieldwork, bridging, spars, etc.; it also produces good shingles, and native workmen frequently make their planes of it. During the time that windmills were used in British Guiana the bullet tree was considered to produce the best wood for the arms of the mill. Wood-ants will not attack balata, except the bark and sap, and when stored the former should be stripped off as a safeguard. Weight 70 lb. per foot cube. Crushing strength, 4.77 tons per square inch. Modulus of rupture (tested by breaking spars of 6 inch diameter)=16,000 lb. per square inch. There is good and bad balata wood (as with other timbers), and natives will endeavour to impose inferior stuff, which is also the case with other woods. "Balata chien," which resembles the black balata and is somewhat harder, is totally worthless. The balata is one of the most important trees of the West Indies, and in Dutch Guiana special laws have been made to control the industry. It yields the "gum-balata," which is intermediate in its properties between caoutchouc and gutta percha. Its fruit is very sweet, and tastes like the sapodilla, being about the size of a large English cherry. Many of the trees are cut down while the fruit is ripe. From the seeds oil can be extracted. The bark of the bullet tree is used medicinally by the Indians, and occasionally as an emetic. The value of the wood on the spot is about £10 per ton.

10. BAMBOO, which prefers wet lands, grows in clumps of clustering hollow stems, with rings, the bright green colour of which changes to yellow after cutting down. There are two sorts, male and female. The male bamboo (*Dendrocalamus strictus*) has almost a solid stem, with only a very small central perforation, and is much rarer than the female or common bamboo. It is practically a cane, and may be applied to the same services. The fibre can be made into paper, and into a valuable packing for the wheel boxes of railway carriages. The female bamboo (*Bambusa vulgaris*) has a hollow stem, and reaches to three or four times the size of the male, with a hole 4 to 6 inches diameter. The height is often as much as 30 feet. It is useful for light framework, and for planting on earth slopes to prevent slipping; and is also serviceable for subsoil drainage, if the internal divisions are pierced. Split bamboos are used on native huts for eaves-gutters, and have also been set in frames and converted into shutter screens for verandahs.

11. BARTABALLI (*Achras mammosa*), from the Moraballi creek, Essequibo river, British Guiana. This tree grows on sandy and clay soils, and is found plentifully up the Essequibo and Demerara rivers; it averages a height of 90 feet, and can be had to square 20 inches free of sap. The wood is close grained, light, of a pale brown colour, and is useful for making articles of furniture, and for partition boards, doors, etc. The tree produces a milky juice somewhat similar to "gum-balata," but of a sticky nature. The fruit is good-eating,

and is eagerly sought for by the Indians during its season (about April) when, with characteristic carelessness, the trees are cut down in large numbers merely for the sake of obtaining it. Weight, about 56 lb. per foot cube.

12. BULLET OR BULLY TREE (*Dipholis Montana*), is a native of Jamaica and Cuba; it grows to 4 feet diameter, and the wood is hard, close-grained, and heavy. It is largely employed in general construction, is durable, and much used for sawing into boards, planks, scantlings, and shingles. There are several varieties, not all belonging to one species. The term bullet or bully trees seems to be a vulgar classification for any hard, heavy, or close-grained timber.

13. BREAD FRUIT (*Artocarpus incisa*), which is found in most of the islands, is a timber tree some 20 feet high with beautiful large leaves. It has been imported into the West Indies from the South Sea Islands. The wood is pretty when polished, and suited for furniture, boards, and internal house work. The fruit is called the "daily bread" of the negro, and is a staple article of food, being usually cut into pieces and roasted or baked. It yields a good starch, too, for ordinary purposes. Another kind of bread-fruit tree, with great leaves, is found in the higher forests. The wood is slate-coloured, with a straight grain, and splits easily; hence it is excellent for making laths.

14. BREADNUT (*Brosimum Alicastrum*, Sw.) This tree, a native of Jamaica and other islands, is about 80 feet high, generally straight, with a diameter of about 2 feet, and grows abundantly in the interior. The timber is good, and makes capital boards, which take a high polish, and furnish beautiful flooring. The heartwood has a rich brown colour, with very durable qualities, and is excellently fitted for ornamental work of all kinds. The nuts and leaves form a valuable fodder, readily eaten by horses and cattle.

15. CACONIES (*Ormoseia dysacarpha*). Found in Dominica. A large tree, 3 or 4 feet diameter, common in the forest, the wood being useful for all kinds of house work, inside and out, rafters, posts, etc., and for any other purpose for which lumber is employed. It is called the "bead" or "necklace" tree, on account of the seeds being used for personal adornment. These are very hard and roundish, beautifully polished, and of a bright scarlet colour with a jet black spot at one end. They are considered of value in Europe, and they might be made an article of export.

16. CALABASH (*Crescentia Cujete*). Found in most of the islands. The tree is comparatively small, about 30 feet high and 18 inches diameter, pretty growing, with peculiarly arranged small leaves clustering close to the horizontal branches. The wood is hard, tough, and pliant, and, being almost black, takes a fine polish. Being of crooked growth it is only employed for small work, such as handles of tools, carriages, cattle yokes, etc., and in British Guiana for bullet-proof stockades. Weight 54 lb. per foot cube. Crushing strength, 1.42 tons per square inch. The shell of the fruit is converted by the peasants into cups and water utensils. The expressed juice of the pulp is a purgative. Value about £5 per ton.

17. CARAPA (*Carapa Guianensis*). Found in Trinidad and British Guiana. A very abundant and useful wood, bearing a considerable resemblance to cedar. It is strong and coarse, and is much used for house building and furniture. The tree is from 2 to 3 feet diameter, and will reach 120 feet in height; value on the spot £8 per ton. There are two kinds, the white and the red. Carapa, or caraba, is also known as crabwood. The seeds yield the well-known "crab-oil," and the bark is used for tanning.

18. CASHEW (*Anacardium occidentale*) grows in most of the islands. A short and spreading tree 30 to 40 feet high, and about a foot in diameter. The wood is red, moderately hard, and close-grained. Weight, 61 lb. per foot cube. Crushing strength, 3.76 tons per square inch. Produces a black juice used for staining floors, etc., as a preservative from the attacks of ants, and in bookbinding to protect from moths; it likewise makes an excellent marking ink. The juice from the bark is astringent, and is used as a flux for soldering metals. A gum is obtained from the tree similar in its properties to gum arabic, and a very intoxicating drink can be made from the buds and leaves. The kernels yield a valuable and nutritious oil, and are a great delicacy when roasted.

19. COCCUS, or West Indian Ebony (*Brya ebenus*), a native of Jamaica and Cuba. A small tree, 15 to 20 feet high, with drooping branches, and rarely found with a diameter over 8 inches. It has a hard deep-coloured heartwood, close-grained, and is exported. Used for handles of tools, etc.

20. COCOANUT (*Cocos nucifera*). These palms are greedy of salt, and essentially belong to the sea-shore, although they will thrive at a considerable distance inland. The tree is slender, without branches, and from 40 to 80 feet high, ending in a plume of fronds, the stem being usually wavy from the effects of the wind. The wood when matured is of a most peculiar texture, consisting in cross section of a multitude of dark brown specks in a lighter ground, and of a streaky appearance longitudinally. It is strong and heavy, and exceedingly pretty when polished, but most hard to work, although when freshly cut it is spongy. When well seasoned it will last for a long time underground. Weight, 70 lb. per foot cube. It is known in commerce as Porcupine wood (from its speckled colour resembling porcupine quills), and is adapted for walking sticks, fancy articles, frames, furniture, rafters, and for inlaying, but the tree is generally too valuable to cut down for such purposes, or for timber. The wood in the green state is very porous and spongy, having a great degree of resistance to rifle shot. In the native wars of Samoa it was much employed in the building of defensive works. Cocoanut oil is pressed from the dried kernel of the nut, and the strong fibrous husk, called coir-fibre, which covers it, is much used for matting and cordage. A dye can be extracted from every part of the plant, producing a dirty brown colour. It is the most valued of the palms because of its numerous economic properties. Sunlight and exposure to regular breezes are most beneficial to the cocoanut tree, and its cultivation is a very profitable industry.

21. CONTREVENT (*Lucuma multiflora*). Grows in Trinidad, St. Lucia, etc. This is a noble timber tree, producing an excellent hard wood for mill rollers, frames, furniture, and house building.

22. CORKWOOD, West Indian (*Ochroma lagopus*). Found in Jamaica, Trinidad, St. Lucia, etc. A tree which grows to two feet diameter, and 20 to 40 feet high, and is only to be found in the open or cleared land. The wood is white, with a hole in the heart, and is softer than ordinary cork, for which it is utilized as a substitute for stopping bottles, by fishermen to float their nets, and for other purposes where light wood is required. The bark gives a useful fibre, for rope-making. A soft cotton or down comes from the seed envelopes, and is employed for stuffing pillows, etc. It is termed *Down Tree* in Jamaica.

23. DETERMA, from the Moraballi creek, Essequibo river, British Guiana. Grows best on clayey gravelly soil, and is more plentiful in the Moraballi creek than in any other part of the colony below the rapids. The average height is 100 feet, and it can be had to square up to 30 inches. The wood is of a colour resembling cedar, and is used for planking boats, constructing railway carriages, and for many other purposes requiring a light and strong wood. Determa is also employed for the masts and spars of vessels, which are procurable from 70 to 90 feet long, and 14 inches diameter at the smallest end. Logs have been obtained 42 inches square.

24. DOGWOOD (*Piscidia erythrina*). Occurs in British Honduras, Jamaica, St. Lucia, etc. A straight tree, growing to a height of 100 feet and 30 inches diameter. The wood is hard; it is employed for rollers of native sugar mills, and is converted into charcoal for gunpowder. It is tough and elastic, and used in cart building for the body and wheels. The root bark is employed in the United States as a narcotic, and locally to stupefy fish. A variety of this wood, which is slightly harder, is known by the Indian name of *Javin*.

25. DUKALA-BALLI, from the Moraballi creek, Essequibo river, British Guiana. This is a rare tree and grows in clay and sandy soil. It attains a large size, the average height being 120 feet, and it will square, free of sap, 20 inches. The wood is of a deep red colour, heavy and close grained, and is used for making articles of furniture, bedstead posts, etc. It takes a fine polish, and is durable.

26. DUKURIA, from the same place, is plentiful throughout the colony and grows in dry soils. The average height is 90 feet, and it will square 16 inches free of sap. It is used for house-framing and many other purposes, and is a very serviceable wood. There are two kinds of Dukuria, fine- and large-leaved.

27. FLAMBEAU, or Torch wood (*Tecoma stans*), found in the majority of the islands, is a small tree, but the wood is extremely durable, hard, and heavy, with the annual rings distinctly marked in cross section. It is obtainable in lengths of 20 feet and over, and 7 inches at butt. Excellent for posts and outside work, such as fences, for which it is commonly employed on War Department lands. There are two sorts—black and white. Drugs are procured from the wood, which blazes brightly when burnt; hence it is used for flambeaux, or torches.

28. FOGLEKOP, from the Itoori-bisci creek, Essequibo river. Grows in sandy soil, and is a light coloured close-grained wood of little weight. It is plentiful on the Essequibo and Pomeroon rivers. It furnishes boards used for indoor work, doors, partitions, etc. The average height is 70 feet, and it will square 12 inches. Foglekop bears a small eatable fruit, the seeds of which contain oil.

29. FUKADIE, from the Moraballi creek, Essequibo river. The tree grows on sandy soil to about 80 feet, and it can be had to square 16 inches free of sap. It is used for house-framing, and is durable for indoor work. Fukadie is very plentiful on the Itoori-bisci creek, and generally in Essequibo.

30. FUSTIC (*Chlorophora tinctoria*). Found in the majority of the islands. Grows rapidly, forming a fair-sized tree in five or six years, and living in almost any soil. The wood is close grained, hard, tough, and of a bright and extremely pretty canary yellow colour. It produces handsome cabinet work, panels, etc., and is the finest for hubs of wheels, but is chiefly exported as a yellow dye-wood, especially from Jamaica. Weight, 42 lb. per foot cube. Eight tons per annum have been exported from St. Lucia to the United Kingdom. About 100 tons are exported annually from British Honduras. This tree (called *bois d'orange* by the natives in some of the islands) must not be confounded with the orange fruit tree, though fustic also possesses a small sweet fruit.

31. GALBA (*Calophyllum calaba*). Found in Jamaica, Trinidad, St. Lucia, etc. An evergreen, which makes fine hedges because of its rapid and vigorous growth; height 50 to 60 feet, and 2 to 4 feet diameter. The wood is of a white to reddish colour, hard and durable, and texture often pretty. It is good for constructional purposes, shipbuilding, and heavy machine work; for posts, furniture, and felloes of wheels. Bears exposure to moisture and lasts well in water. Weight, 46 lb. per foot cube. Value on the spot £5 per ton. The seeds yield an oil for lamps, and drugs are prepared from the resinous juice. Galba is also known as crabwood.

32. GRANADILLA.—Grows in British Honduras, the height being about 80 feet, and diameter 2 feet. It rises 50 feet without a limb, and is, therefore, a conspicuous forest tree. Produces a hard, dark-red wood, with a beautiful fine grain, and easy to work. Being abundant it is used for furniture and house decoration. This tree must not be confounded with the vine Granadilla bearing a luscious fruit.

33. GREENHEART, or Bibiru (*Nectandra Rodiaei*), comes principally from British Guiana, but it also grows in Trinidad, Jamaica, and Dominica. The tree is 60 to 100 feet high, and up to 2 feet diameter, yielding barks 50 to 60 feet long, and 18 to 24 inches square without a knot. It grows in clay soil near the rivers and creeks, especially the Moraballi creek, Essequibo river. There are three varieties of greenheart, yellow, black, and mainop, all most serviceable and durable woods if cut when mature. It should be specified to be from logs of not less than two feet in diameter, as trees of less thickness are young and sappy, and such wood is liable to shrink and split. The timber comes into the market roughly hewn, much bark being left on the angles, and the ends of the butts are not cut off square. The section is of fine grain, and very full of fine pores, like that of a cane. The annual rings are rarely distinct. The heartwood is dark green or chestnut coloured, the central portion being deep brownish-purple or almost black; the sapwood is green, and often not recognizable from the heart, while the general appearance of the wood is a greenish-yellow colour. Greenheart is close, hard, durable, and said to be the strongest timber in use. It is apt to split and splinter, and therefore requires great care in working, but it is tough and elastic, and a small beam, 3 ft. by 1 in. by 1 in., has withstood a central load of 10 cwt. without breaking. Breaking weight, 1,424 lb.; crushing weight, 12,000 lb. Weight, 60 lb. per foot cube. Greenheart is one of the eight first-class woods at Lloyd's, and is unsurpassed by any other in British Guiana. It is used for marine works, such as piles, piers, jetties, dock gates, and for shipbuilding in kelsons, knees, planking vessels, etc. It contains an essential oil, and many authorities state that on this account it resists the attacks of the *teredo navalis*, or ship-worm. This, however, is doubtful, and it has been found to be much eaten away by molluscs in sea-water at St. Lucia, when used for piles. But it appears that in any case worms will only penetrate the sapwood. The presence of the oil causes the timber to burn freely, so that in Demerara it is known as "torchwood." From the bark and seeds "bibirine" is extracted, and the Indians use the seeds medicinally in cases of diarrhoea, and sometimes for food, when ground and mixed with other meal. Because of the great demand for greenheart and the want of legal restriction to prevent the cutting of the young trees by wood-cutters and charcoal burners, it is becoming extremely difficult to procure good timber, and its preservation is worthy of the attention of the Colonial Legislature.

34. GRI-GRI (*Martinezia caryotafolia*). Found in Trinidad, Jamaica, St. Lucia, etc. A sort of small cane palm rising 20 feet high, with rings on the trunk. The wood is streaky and almost black: it furnishes a beautiful veneer, and makes handsome walking sticks. A fibre is produced from this tree which is said to be even stronger than that from the gru-gru. The cabbage is very sweet, and may be eaten raw.

35. GRU-GRU, Grou-grou, or Groo-groo (*Acrocomia lasiopatha*). Also called the Macaw palm, or Great Macaw tree. Found in Trinidad, Jamaica, St. Lucia, etc. It is bigger than the gri-gri, with trunk 30 to 45 feet high, covered with black spines, and supporting a solid head of feathery leaves. The outer part of the trunk is black as ebony, hard, heavy, and durable, and susceptible of a high polish. The wood possesses the characteristic of never bending, warping, or curling longitudinally. It furnishes a beautiful veneer, and might be used for furniture and cabinet work. It is sometimes run into mouldings, its dark colour forming a fine set-off to a panel of pine, and it likewise makes handsome walking

sticks. A fibre of remarkable fineness and strength is prepared from the leaves. Both the gru-gru and gri-gri palms produce seeds which contain a large proportion of sweet palatable oil, which in St. Vincent is extracted and used for cooking purposes. This oil is also used for external application to ease pain.

36. HACKIA (*Siderodendron triflorum*), from British Guiana. The tree averages 65 feet in height, and will square 12 or 14 inches free of sap. It grows plentifully in some localities on dry sandy soil, and during the time it is in flower in November it is one of the most beautiful of the forest trees. The wood is exceedingly hard, close grained, and heavy, and of a brown colour. It is valuable for making cogs and shafts, but is almost too hard for any other purpose.

37. HIAWA-BALLI (*Omphalobium Lambertii*), from the Itoori-bisci creek, Essequibo river. The average height is 90 feet, and it will square, free of sap, 12 inches. Hiawa-balli grows in sand and rocky soil, and often attains a large size. It is a rare tree, and the wood is in great request for cabinet work, being of great beauty and easily worked. It has a sticky gum.

38. HOUBOO-BALLI, from the same locality, where it grows plentifully. The tree reaches an average height of 100 feet, and will square 20 inches free of sap. The wood is of a light brown colour, variegated with black and brown veins; it takes a fine polish and is useful for making articles of furniture, and cabinet work of any description. Under water it lasts a long time, and on the bottom of a boat will outlast almost any other wood. The bark contains a sticky gum.

39. IRON WOOD (*Laplacea hamatoxylon*). Every timber region has its own ironwood. This particular variety is found in British Honduras, Jamaica, St. Lucia, etc. It is also termed blood wood, from its red colour. The tree is about 30 feet high, and a foot in diameter. It is the hardest timber in the West Indies, and generally found not far from the sea, and is of a deep reddish colour, heavy, with dense grain, and will not decay in wet or dry soil. It has much the same qualities as boxwood, and is useful for the same purposes, and for posts. Iron wood has no heart, so it makes little difference whether it is cut young or old. A good dye is obtained from the rich red wood.

40. IRRARIADAN, from the Moraballi creek, Essequibo river. The average height is 80 feet, and it can be had to square 10 inches free of sap. It grows plentifully on high sandy soil, but is little known. The wood is fine, of a dark brown colour, and is suitable for cabinet work, partition boards, staves, and many other purposes.

41. ITIKIBOURA-BALLI, from the same place. It grows on clay soil, and on the islands in the rapids of the Essequibo. The tree is comparatively rare below the rapids, and does not attain to an average height of more than 70 feet. The sapwood is white, and its junction with the heart, which is of a deep brown or almost black, is sharply defined. The timber can be had to square up to 15 inches free of sap, and is employed for making articles of furniture and walking sticks. Itikiboura-balli is one of the heaviest and closest grained woods in British Guiana.

42. JACK FRUIT (*Artocarpus integrifolia*). Found in Jamaica and Trinidad. The wood is yellow, hard, takes an excellent polish, is beautifully marked, and is one of the handsomest for furniture. Weight, 40 lb. per foot cube. It yields, on boiling, a yellow dye. The bark produces a gum which is used as a cement and as bird-lime; also a fibre.

43. KABUKALLI, from the Moraballi creek, Essequibo river, British Guiana. This tree is plentiful all over the colony, and thrives best in loose sandy soil. It is one of the tallest forest trees, and grows very straight; its average height is 120 feet, and it can be had to square 30 inches free of sap. Kabukalli is used in boat building, and for timber is little inferior to Mora. It has a very unpleasant smell, and is disliked by worms. Weight, 70 lb. per foot cube. The Indians living in the wet savannahs, or where the rivers are free of bush to form a shade, prefer canoes made of this wood to any other, as they will not split from exposure to the sun. A gclatinous substance forms on the stump after cutting down a kabukalli tree; it has a disagreeable smell, and never hardens.

(This article will be continued in the August JOURNAL.)

LECTURES AND PAPERS.

"NOVA SCOTIA."

(By JOHN HOWARD, Esq.)

Lord STRATHCONA presided on the 24th March at a lecture entitled "Nova Scotia," delivered at the Institute by Mr. JOHN HOWARD, Agent-General for Nova Scotia.

The chairman, in his introductory remarks, referred to Nova Scotia as one of the most important provinces of the Dominion, notwithstanding the fact that the provinces further west had lately attracted more attention.

Mr. Howard began his lecture by giving an interesting account of the early history of the country. It was the most easterly province of the Dominion, and had been discovered in 1497 by the Cabots, who had first seen that portion of the coast of Cape Breton now considered to have been the Sugar Loaf Peak, in the Cape North Range, but which they had called Prima Vista. Nova Scotia had shortly afterwards been visited by the French, who had given it the name of Acadie, a word derived from the Indian "Cadie," meaning "Land of Abundance." Both the French and English had laid claim to the country, the former on the ground of settlement and the latter on that of discovery: the result being that for more than two centuries Nova Scotia became the scene of constant strife between the two peoples, and, either by conquest or treaty, had passed continually from the one to the other, until in 1701, when it was permanently attached to the British Crown.

Turning to the resources of the country, Mr. Howard said that since 1504 its fisheries had been famous for their variety and inexhaustible supply, and to-day the province contributed over 40 per cent. of the total yield of fish of the Dominion.

The coalfields of Nova Scotia embraced an area of about 4,000 square miles, and the estimated deposits available were 40 billion tons. In proportion to the entire output of the whole of Canada, the province was responsible for 60 per cent. of the coal raised. One company alone was stated to have resources sufficient to supply 3,000,000 tons of coal for many years, and to own a colliery which last year had produced 751,000 tons, a yield said to be the largest of any single colliery in the world. The amount of wages paid in this industry amounted annually to upwards of £1,000,000. Extended markets were being opened up in Europe for the trade, and the output of last year had shown an increase of 50 per cent.

The country possessed iron ores of the richest description in boundless abundance, which, being in close proximity of some of the largest coalfields in the world, and contiguous to lime-stone, rendered the establishment of a large iron and steel industry almost a matter of course. Mr. Howard contended, taking these advantages into consideration, that at the works at Sydney, Cape Breton, steel could be produced at 6 dollars a ton lower than at Pittsburg, a place which was usually considered to afford the facilities for the most economical production of steel. A few years ago Sydney had a population of between 2,000 and 3,000, but this, owing to the development there, had increased in 1901 to nearly 18,000.

Gold was found scattered all over the province, the auriferous area embracing 3,000 square miles, extending principally along the southern shore. Low grade ores were met with in wide belts in many districts, and were being profitably worked. The returns reported, however, had hitherto been comparatively small, as, until quite recently, gold-mining had not been systematically developed.

The lumber and pulp industries were very valuable, and gave employment to large numbers of men. The province was also eminently adapted by nature for agriculture and fruit-growing, the soil being rich and easy to work, whilst the climate, neither too hot in summer nor too cold in winter, lent itself to the rapid development of vegetation of all kinds.

The geographical position of Nova Scotia gave it a special advantage in connection with any proposed fast steamship line between England and Canada, as securing a short sea voyage, such a line would Mr. Howard contended, be of immense service to the Dominion in greatly accelerating the passenger traffic across the Atlantic.

At the close of the lecture a number of excellent views were shown of the scenery of the province, and also of the various industries and resources, to which Mr. Howard had alluded.

Lord Strathcona, in proposing the vote of thanks, said that he was sure the audience must have listened with great pleasure and interest to the account Mr. Howard had given of the country; which account, combined with the views they had seen, could not fail to have brought home to them all a sense of the reality of the advantages Nova Scotia possessed as a field for emigration and as a valuable part of the Empire. Although had either Mr. Duff Miller been lecturing on New Brunswick, or Mr. Turner on British Columbia, the audience would probably have listened with equal pleasure, and been equally convinced of the importance of those provinces.

Nova Scotia possessed some of the best mines, so far as the precious metals were concerned, of any in Canada, and its coalfields were unequalled in the Dominion. He had been told that besides the mines at present in operation another was about to be opened which it was anticipated would contain, and would show, the greatest quantity of coal of any known coal-mine. He hoped that within a few years, the shipyards of Nova Scotia would be producing vessels quite equal to any turned out in the old country, not only merchant ships, but also war vessels. For the defence of the Empire, men to man these would readily be found in Nova Scotia, in the 70,000 to 80,000 hardy fishermen than whom there could be no better material for the British Navy. A great many wooden ships had formerly been built in Nova Scotia, but although the days of such ships were passed he had every hope that Nova Scotia would again become a ship-building centre for iron and steel ships.

Speaking of a fast-line service, Lord Strathcona way of opinion that before long one would be established and that ships would be making the passage from some port in Great Britain to Cape Breton within 4 days and that Montreal would thus be brought within 5 days, and the Pacific within 9 days, of the United Kingdom. Also passengers by this Nova Scotia route travelling to New York would have 600 or 700 miles less of sea, and arrive at their destination a day earlier, than if they had travelled by any of the direct lines to New York.

"A JOURNALIST'S SCAMPER THROUGH SIBERIA AND MANCHURIA."

(By MR. JOHN FOSTER FRASER.)

(ANGLO-RUSSIAN LITERARY SOCIETY.)

At the meeting of the A.R.L.S. on June 3, Mr. E. A. Cazalet, president of the Society, in the chair, Mr. John Foster Fraser, the famous cyclist, and author of *Round the World on a Wheel*, *The Real Siberia*, etc., gave a most interesting lecture entitled *A Journalist's Scamper through Siberia and Manchuria*, which was illustrated by a large number of excellent lime-light views.

After describing his journey to Siberia, starting from Moscow and travelling by the Great Trans-Siberian railway across the flat, featureless plains of Russia and then over the Ural Mountains—beautiful chiefly by contrast—Mr. Fraser spoke of the great surprise he experienced when the train at last steamed into Omsk. All his preconceived notions of wild and snow-covered Siberia, inhabited by wretched convicts and adorned by huge gloomy prisons, were instantly dispelled, and he found it difficult to believe that he was actually in the heart of that great country. It was true that the stations were a long way from the towns, and that the hotels were far from clean, but in the matter of fine buildings, universities and schools, also modern conveniences such as trains, electric light, amusements, restaurants, and so on, the large Siberian towns were little behind those of Europe. Unfortunately, the Siberian was not a good agriculturist and was slow to develop the resources of his country. He was also lacking in enterprise, so that nearly all the important business was in the hands of foreigners, especially of Germans and Americans. Great Britain was very poorly represented, except in the case of the well-known ice-breaker on the Lake Baikal built by Armstrong, Whitworth and Co. Many Danes had gone to Siberia and were engaged in a flourishing butter-trade; large quantities were exported monthly, of which much was sold in England as "Danish." Mr. Fraser gave very interesting accounts of his visits to the Russian prisons at Tomsk and Alexandrovsk, showing photographs of some of the prisoners who had been sentenced for murder, forgery and various crimes. These convicts worked at different trades, for which wages in the form of pocket money were given, and Mr. Fraser thought that their treatment seemed, on the whole, to be humane and sensible. With regard to the "politicals," however, it was very sad to see young boys of eighteen years and upwards imprisoned and exiled, cut off from civilisation and from all their friends, merely for having taken part in some youthful student-demonstration. It was a good thing for Siberia, however, as these men rarely returned to Russia, but married and settled down in the Siberian towns, where they did much towards educating and enlightening the population. In conclusion Mr. Fraser gave an amusing and graphic account of his journey by the Manchurian railway, which was then unfinished, and by which foreigners were not allowed to travel without a special written pass. As may be imagined, therefore, it was only by the exercise of considerable ingenuity that the lecturer was able to penetrate into these regions and by the endurance of a good deal of hardship and discomfort. He discovered that the silver key opened most doors. He stated that, upon the whole, the impression produced on him by Siberia was decidedly favourable. The undeveloped mineral and other natural riches of the country were most remarkable.

After the lecture several of the audience made interesting remarks. Miss Meakin, author of *A Ribbon of Iron*, said that she had travelled to Siberia by the same route as Mr. Fraser, but had been obliged to return by sea *via* Japan and Canada, owing to the Chinese disturbances which had broken out during her journey.

Mr. Ruffmann, a Russian gentleman and author of *Across Siberia by Rail*, recently published by the *Pall Mall Gazette*, advised all who wished to undertake a trip to Siberia and Manchuria, either to learn Russian themselves, or to be accompanied by someone who knew it, also to obtain a proper written Government permission and introductions before starting.

Mr. Skrine, author of *The Heart of Asia*, alluded to the famines in Russia and India as illustrations of the Malthusian doctrines. In the case of Russia he thought the opening out of Siberia would do much to remedy this evil.

Mr. Cazalet, in returning the hearty thanks of the meeting to Mr. Fraser, said that all present must feel, as he did, almost as though they had actually travelled by train, boat and sledge in those far-off regions so graphically described by the lecturer.

PROCEEDINGS OF INSTITUTIONS.
THE LONDON CHAMBER OF COMMERCE.
IMPERIAL CABLE COMMUNICATIONS.

The following is the substance of a communication which has been issued by the Secretary of the LONDON CHAMBER OF COMMERCE, to the various Chambers and Public Institutions which took part in the work of the Congress:—

At the fourth Congress of Chambers of Commerce of the Empire, held in London in June, 1900, the following resolution on Imperial Telegraphic Communications was carried unanimously:—

“That this Congress desires to call special attention to the necessity of completing the All-British Pacific Cable, not only on commercial grounds, but in the interests of the Imperial security.

“That this Congress recommends that support should be given to the action which the Imperial Telegraph Committee of the House of Commons is taking with the view of placing the important matter of electrical communication between the United Kingdom, India, and the British Colonies and Dependencies on a footing commensurate with the present conditions of Inter-Imperial and Colonial relations.

“That copies of this resolution be addressed to the Prime Minister, the First Lord of the Treasury, the Chancellor of the Exchequer, the Secretary of State for India, the Secretary of State for the Colonies, the Postmaster-General, and the Governors of the self-governing Colonies, urging that every reasonable opportunity may be given in Parliament for discussion of the position of the Telegraph Companies in relation to the Government, with a view to an immediate and satisfactory solution being found for the very serious grievances under which the commercial and industrial communities of the Empire have been labouring for a long time past.

“That in view of the great object to be attained, this Congress is strongly of the opinion that it would be a wise policy to make full provision for ultimate State ownership in any arrangements hereafter made to lay cables, by private companies, between British possessions in any part of the globe.

“That this Congress recommends that the principle of State ownership be especially provided for in the cable proposed to be laid by a private company between South Africa and Australia.

“That this Congress urges upon His Majesty's Government the importance of instituting a searching investigation by the Departmental Committee, promised by the Government, into both the shortcomings and the merits of a private system of cables, and consequently into the desirability or otherwise of adopting such a course or policy in the future as would lead to the ultimate expropriation of private cables, and the establishment of State-owned cables throughout the Empire, and to report thereon at the earliest opportunity, such a report to be accessible to the public.

With reference to the first paragraph of the above resolution, you are doubtless fully cognizant of the good progress that is being made with the Pacific Cable, which has reached Fiji, and is expected to be completed by about the end of the present year.

These resolutions were forwarded to the Ministers and Colonial Governors mentioned in the third paragraph therein, and duly acknowledged. The Secretary of State for India promised that the suggestions should receive consideration, in so far as India was concerned, on receipt of the recommendations of the Inter-Departmental Committee on Cable Communications which had been appointed by the Government and was then sitting.

The Inter-Departmental Committee has now issued its report, which is signed by Lord Balfour of Burleigh (Chairman); Lord Londonderry (Postmaster-General); Mr. Hanbury (President of the Board of Agriculture); Lord Hardwicke (Under-Secretary of State for India); Lord Onslow (Under-Secretary of State for the Colonies); Sir John C. Ardagh (Director of Military Intelligence); and Rear-Admiral Custance (Director of Naval Intelligence). The following is a summary of the principal recommendations and conclusions of the Committee:—

(i). In view of the probability of cable-cutting, a variety of alternative routes should be provided wherever it is essential to secure telegraphic communication in time of war.

(ii). Appreciable but not paramount value should be attached to the provision of “all-British” routes. Every important colony or naval base should be connected with this country by one cable touching only on British territory or on the territory of some friendly neutral. After this there should be as many alternative cables as possible following commercial routes.

(iii). We recommend the construction of:—(a) A cable connecting either Rodriguez and Ceylon, Cocos-Keeling and Ceylon or Cocos-Keeling and Singapore. (b) A land line connecting the Straits Settlements and Burma. (c) An “all-British” cable to St. Lucia—to be commenced as soon as the state of cable enterprise in the West Indies permits.

(iv). While land-lines are cheaper to construct and maintain than submarine cables, it is in certain cases essential on strategic grounds that the former should not be permitted to drive the latter out of the field of competition.

(v). We are aware of no power of controlling cable companies possessed by the State besides the following:—(a) The power to make stipulations when granting a subsidy or guarantee. (b) The power to employ public funds in competing or encouraging competition with private enterprise. (c) The power to grant or withhold general facilities. (d) The power to grant or withhold Government messages and unroute telegrams. (e) The power to grant or withhold landing rights.

(vi). The possible advantage of giving guarantees of *minimum* revenue in place of subsidies should be considered.

(vii). No direct pecuniary return should be demanded for landing rights. The concessions should, however, be regarded as a check on any marked unreasonableness.

(viii). The normal policy of this country and its dependencies should be to encourage “free trade in cables.” Exceptions should only be made to this rule on the ground of national, not of private, interests.

(ix). We recommend that the Cables (Landing Rights) Committee should be strengthened, and that its functions should be enlarged so as to include the consideration of all questions relating to cables, that it should be entitled “The Cables Committee,” and that it should report direct to the Treasury, the Board of Trade being relieved of its present responsibilities with regard to cables.

(xi). We are strongly opposed to the general purchase of cables by the State.

(xii). We are not prepared to say that any of the existing rates are excessive, with the exception of those to the Gold Coast and Nigeria. We recommend that an

attempt should be made to reduce these in connection with the renewal of the Eastern Telegraph Company's landing rights at Porthcurno in 1903.

(xii). We would welcome the introduction of “deferred” rates in any case where—(a) the time required for postal communication is considerable, and (b) the cables are not fully occupied with ordinary messages, but (c) are sufficiently occupied to admit of a real distinction between ordinary and deferred messages.

It will thus be seen that the Committee has pronounced emphatically against the general purchase of cables by the State; indeed, it is urged that “the normal policy of this country and its dependencies should be to encourage ‘free trade in cables,’” exception to this rule only to be made on the ground of national, not of private, interests. In view of this pronouncement, it appears that, in the future as in the past, private enterprise will be left to further develop the cable systems of the Empire on commercial lines, but aided by the State under certain circumstances (such as for strategic reasons), preferably by means of guarantees of *minimum* revenue in place of subsidies, with sufficient State control necessary in the public interest and to correct any marked unreasonableness on the part of the companies. With regard to the question of an all-British cable the committee point out the value of such a cable in time of war, on the assumption that cables will not be cut by belligerents, but it is thought that our strategic arrangements must be made on the assumption that a considerable proportion of cables will be cut. The committee “thus arrive at two principles leading to diametrically opposite conclusions. The more probable it is that cables will not be cut, the greater the value of an all-British cable. The more probable it is that they can be cut, the greater value of a cable touching on foreign territory.” In view of these conflicting considerations the Committee have not found it easy to formulate a general rule, but the report goes on to say that “we think, however, that appreciable but not paramount value must be attached to all-British routes; and we regard it as desirable that every important colony or naval base should possess one cable to this country which touches only on British territory or on the territory of some friendly neutral. We think that, after this, there should be as many alternative cables as possible, but that these should be allowed to follow the normal routes suggested by commercial considerations.”

A long list of cable lines that have been suggested to the Committee is enumerated in the report, with the statement that “there is something to be said for the construction of any or all of these lines,” but, the report says, “we do not think that in the majority of cases the advantage is such as to justify the State either in constructing them itself or in aiding their construction from public funds.” Exceptions are made, however, in favour of the three cables mentioned in paragraph (iii) of the summarized recommendations of the Committee (quoted above), on purely strategic grounds.

As to rates, the Committee “are not prepared to say that any of the existing rates are excessive, with the exception of those to the Gold Coast and Nigeria,” and they recommend that an attempt should be made to reduce these in connexion with the renewal of the Eastern Telegraph Company's landing rights in Cornwall next year. The report also states that “we would welcome the introduction of ‘deferred rates’ in certain specified cases.”

At a meeting of the Chamber, held on the 3rd ult., Mr. H. C. RICHARDS, K.C., M.P., gave an address on “The Commercial and Agricultural Potentialities of Burma.” Lord BRASSEY occupied the chair. Mr. RICHARDS said that trading prospects of Burma are not only numerous, but encouraging. Its population are cheerful, happy, prosperous and contented, and the land is ripe for colonization and development. The Burman has been described as the Irishman of the East, but if he has any of the happy-go-lucky characteristics of the south and west of Ireland, his better half has every desire to follow the business-like habits of the Ulster trader, and all the thriftiness of the original Scotch character.

The Burman mother is the retail trader of the Bazaar in every city, and she is not averse to marriages outside her own race when she finds that the pushing Chinaman and the quiet Hindu is prepared to work for his own living, as well as his spending money. A visit to a Burman town or village on a feast day reveals at once the greater spending power of the Burman as compared to the native of India. Even in the matter of recreation the Burman, in spite of every obstacle, made ten railway journeys as against one made by Indians. He spent his money in silk attire, and his wife invested in gold ornaments and diamonds. She had not yet learned to appreciate, as the Egyptian has done, our system of savings banks.

Fortunately the wealth of Burma, outside the Ruby Mines district, was distinctly agricultural, and it could produce all the rice and more than the millions of India required. It has proved this by the figures of the famine year when, thanks to Burma's supply, there was no difficulty in getting rice if the money was forthcoming. For grass, Lower Burma had easily made up the deficit in the expenses of our newer annexation, but last year Upper Burma paid its way, and there was a million surplus for the Indian Budget; this ought to have been locally invested in railway and other productive works which were much required, as any one who had the misfortune to travel, or send goods by the Burma Railway, would personally endorse. Fortunately for the trade and prosperity of Burma it has four great waterways, and the Irrawaddy Flotilla Company provided the best trade route in the world, and one which some day or other would admit of export and import through the Chinese districts which were our boundaries at Bhamo and in the Shan States. A difficult defile had only to be treated like the Iron Gates on the Danube, and with a more liberal spirit Chinese trade might be at once quadrupled.

Better than its rubies were the oilfields of Burma, where if the Government Department was a little less narrow and a little more patriotic, a great output for British capital and native labour might be secured, for in India the Russian oil had decreased the American import to three million gallons, against the Russian output of fifty-seven millions.

The Rockefeller interest and the venal lords of the Deadly Tea Rose were at work in Burma, and trying to get concessions from Government, which would at once enable them to crush the British investor, and to leave its havoc among the native villages, which it did now in our crowded areas, and it would be the height of absurdity if British commerce was to be ousted by the open door. The traders of Burma at Rangoon and Mandalay had approached the London Chamber of Commerce and the Associated Chambers, which the Secretary of State for India so far refused to recognize, and their protests had been passed by in the appointment for a second time of a Civil Servant Chief Judge, which was impossible in any Indian High Court, owing to the statutes establishing them. The complaint of the trader was a definite one: all the suits he had were either of a commercial character on the construction of documents and contracts, or they were revenue disputes between the traders and the Government, and the commercial community objected to the civil servant whose first idea was to get revenue, and the second to uphold the executive, being transferred from the post of Government servant to that of judge in his own cause.

It was a real and pressing grievance, and the English people might just as well be governed by Somerset House and the officials of the Treasury. The only men in India who could afford to be independent were the judiciary, and to place them under a promoted civil servant was a derogation of power and of duty. The native press, as well as the trading community, protested against the action of the Government in this matter. The future of Burma was one of great interest, for it was said that the Hindu from India and the German trader from Europe would push out the Burman, and undersell the English. Burma was no doubt, year by year, increasing her harvest fields and her harvest. Who was to reap them? On these questions the Chambers of Commerce must speak their mind.

THE ROYAL AGRICULTURAL SOCIETY OF ENGLAND.

The usual monthly meeting of the Council of this society was held on the 4th ult., PRINCE CHRISTIAN (president) in the chair. Amongst those present were the PRINCE OF WALES (president-elect), Earl Cawdor, the Earl of Coventry, the Earl of Derby, the Earl of Jersey, and Earl Spencer.

The President, in moving that the letter, dated May 7, 1902, from the Prince of Wales accepting the office of president of the society, be entered upon the minutes, said he was sure he was expressing the feelings of the Council when he said how much gratified they were that the Prince of Wales had accepted the office of president of the society for the ensuing year. The motion was unanimously agreed to. Mr. Herman G. Kleinwort was elected a governor of the society, and 19 duly nominated candidates were admitted into the society as members.

On the motion of Sir Nigel Kingseote (chairman of the Finance Committee), the secretary was authorized to issue to any duly nominated candidate on receipt of a remittance for £1 (the amount of the annual subscription of a member) a special ticket entitling such candidate to the same privileges as a member during the meeting held at Carlisle from July 5-11 next.

Lord Derby reported from the General Carlisle Committee that the programme for the show had been settled that morning. The implement department and dairy only would be opened on Saturday, July 5, at a charge of 1s. each person. All departments of the show would open on Monday, July 7, when the judging of live stock, poultry, and produce would take place. On July 8, 9, 10 and 11, there would be daily parades in the large ring of cattle and heavy horses in the morning, beginning at 11 am., and of light horses, followed by horse-jumping competitions in the afternoon, beginning at 2 pm. Butter-making and horse-shoeing competitions would be held on the Wednesday, Thursday, and Friday.

The Secretary said that numerous letters had reached him from Agents-General and others announcing the intention of representatives of their colonies, who would shortly be arriving in London for the Coronation ceremonies, to inspect the society's show at Carlisle.

Lord Derby reported on behalf of the Journal Committee that a letter had been received from the Meteorological Office, enclosing a copy of a circular intimating that the Meteorological Council would supply during the ensuing hay and corn harvest season daily telegraphic forecasts of the weather to persons desirous of receiving them upon payment of the cost of the telegrams.

Mr. Wheeler presented a report by the society's consulting botanist (Mr. William Carruthers, F.R.S.) upon a widespread injury in Herefordshire to plum trees, the young twigs dying off, and the cause of the injury being the parasitic fungus *Monilia fructigena Pers.* The report recommended that the dead twigs should be removed and burnt, the most important time for attending to the matter being in the autumn.

The Hon Cecil T. Parker brought up a report presented to the Veterinary Committee by Professor McFadyen with reference to the contagious diseases of animals. The report stated that during the last four weeks outbreaks of anthrax had numbered 56, and the animals attacked 94, as against 54 outbreaks and 63 animals attacked in the corresponding four weeks of last year. During the same four weeks there had been 66 outbreaks of glanders notified, with 120 animals attacked. The corresponding figures for last year were 108 and 196 respectively. Two cases of rabies had been reported since the last meeting of the committee, one in the county of Devon and the other in Pembroke. This raised the total number of cases since the beginning of the year to 11. The reports with regard to swine fever continued to be very favourable, only 152 outbreaks having been notified during the past four weeks as against 478 outbreaks during the corresponding period of last year. No further cases had been detected of foot-and-mouth disease, and it might reasonably be concluded that the country was again free from the disease. During the past winter it had been ascertained that on several farms in different parts of the country considerable numbers of sheep had died from black quarter (quarter evil, or "strike"), and it had therefore been considered advisable to carry out at the Royal Veterinary College a series of experiments to ascertain whether the method of protective inoculation which had been largely practised in the case of young cattle might with safety be applied to sheep. The experiments were not yet completed, but those already carried out had yielded results very favourable to the operation, both in respect of safety and efficiency.

Lord Moreton, from the Education Committee, reported that the third examination for the national diploma in agriculture had been held by the National Agricultural Board at the Yorkshire College, Leeds, from May 5 to 8 last, when 67 out of 69 candidates presented themselves. Twenty six candidates passed part I., qualifying them to sit for part II. in 1903 or 1904, and ten candidates obtained the national diploma.

On the motion of Mr. Frankish (chairman of the Implement Committee) it was resolved to offer prizes of £50 and £20 for wind engines for pumping purposes in connection with the society's meeting of 1903, the trials to take place in the London showyard in the months of March and April next year, and the entries to be made by January next. On the motion of Sir Nigel Kingscote, it was resolved that a special committee be appointed to consider the arrangements to be made for the show of 1903.

The Council adjourned until Wednesday, July 9.

THE ROYAL GEOGRAPHICAL SOCIETY.

"THROUGH SOUTHERN ABYSSINIA."

At the meeting of the Royal Geographical Society on the 9th ult., a paper was read by Mr. OSKAR NEUMANN describing a journey from the Somali coast, through Southern Abyssinia, to the Sudan. Sir CLEMENTS R. MARKHAM presided. Mr. Neumann said that the expedition started from Varrad on May 22, 1900. On the 23rd the village of Biaworaba, Paulitschke's furthest point in this direction, was reached, and the country of the Enia was entered. The people spoke a Galla dialect, but were nomads, like the Somali.

Mr. Neumann described the country onwards to the land of the Arusi, where the expedition struck the route of Dr. Donaldson, which was followed to the sacred town of Sheikh Husein. In accordance with orders from Menelek, the party proceeded to Adis Abeba, and, on the way, came to Mount Abulkassim, which was held sacred by the people of Sheikh Husein. Although it had been sighted by the Italian explorer Traversi, it had not before been visited by Europeans. It contained caverns, sometimes occupied by Mahomedan pilgrims, as well as the grave of Sheikh Abulkassim, a descendant of Sheikh Husein.

Adis Abeba was reached on August 14, and free permission was obtained to travel anywhere in the Abyssinian dominions. Owing to the time which had already been spent on the journey it was decided to divide the caravan. It was arranged that Baron Erlanger should return by another route to Sheikh Husein and make thence for Lake Rudolf, and that Mr. Neumann should explore the highlands of Shoa proper, and afterwards make his way west to the Sudan.

In the remainder of the paper Mr. Neumann gave an interesting description of the country which he passed through. In the valley of the Blue Nile, to which his party descended from the edge of the plateau at Abuye, an Abyssinian fort, they were terribly bitten by mosquitoes, but only one, who had refused to take quinine, suffered from malaria. In Uba, where a fort had been built by Count Leontieff's officers, glanders broke out among the animals, and the disease appeared to be endemic on the northern feeders of Lake Stefanie. In Kosha and Konta, north of the Omo, the party found the slave trade in full swing, children being offered for sale at the weekly markets, probably owing to the recent famine.

When the party arrived at the river Akobo (Ajuba) they were in a sorry plight. Provisions were nearly exhausted, game was scarce, and the glanders had again broken out

among the animals; but the situation was saved by the opportune arrival of an Egyptian steamer with Slatin Pasha and Colonel Bluet on board, and the expedition was given a passage to Khartum, arriving there on June 15 last year.

The scientific results of the expedition were briefly summed up as follows:—In Somaliland the route of Paulitschke was connected with that of Dodaldson Smith, and both were linked with the surveys of Traversi, Ragazzi, and Stecker in Southern Shoa. In Shoa the country between Adis Abeba and the Blue Nile was surveyed for the first time, while during the southward journey along the eastern side of the rift valley the lake system between Zwai and Abaya was for the first time elucidated. In Kaffa and neighbouring countries, where the route led midway between those of Wellby, Böttger, and Austin in the south, and of De Bonchamps and Marchand in the north, the maps of Cecchi and Borrelli were corrected, and the watershed between the Nile and the Omo was defined. Ethnologically, light was thrown on the distribution of the Semitic, Hamitic, and Bantu elements, especially by the investigation of the Semitic enclave of the Argobba south of Harar, the interesting tribes of the Walamo and Sidamo in the region of the lakes and the Omo, and the northern extension of the Bantu, as represented by the Gardulla, Doko, and, further west, the Shuro, Binesho, and Sheko. Ethnological collections and studies of the languages were also made.

As regards geology, the discovery of fossils of upper Jurassic age (north of the Wabi), and, still more, that of Cretaceous strata in the Gillet Mountains, was of interest. The belt of country from Abulkasim and Abu Nas to the Blue Nile and the headstreams of the Sobat consists for the most part of Tertiary volcanic rocks, the date of the formation of the rift valley—formerly occupied in its northern part by a great lake basin as is shown by molluscs found on the Suksuk river—belonging also probably to the Tertiary period. Gneiss with quartzite was found at about 3,000 feet in several places on the Blue Nile and Omo. A large collection of rock specimens was made.

Between Zeila and Adis Abeba Dr. Ellenbeck made a collection of some 2,500 botanical specimens, and, after separating from the rest of the party, Mr. Neumann obtained, single-handed, some 200 plants. His chief work, in addition to the geographical survey, was, however, zoological research, and his zoological collections were the largest that had ever come to Europe from Africa at one time.

Five distinct faunal regions might be defined in the country traversed:—(1) Northern Somaliland showed, especially near the coast, strong signs of palaearctic influence. (2) The Galla countries south of Harar, though showing much resemblance to the former group, were entirely without this element. Both of these groups contained forms not found in other African faunal regions. (3) The fauna of the Abyssinian highlands, first made known by Rüppel, stretched north-west from the tableland of Didda, with an eastern extension as far as Harar on the Hawash-Webi divide, many Abyssinian birds being found on the Gara Mulata, south-west of Harar. In the lake region a mixture of Abyssinian and Somaliland forms occurred, with others previously known only from British and German East Africa. (4) On the Omo the fauna was marked by the presence of a large number of West African forms, while (5) the true lowland fauna of the Sudan was met with on passing the Gurafarda range. Mr. Neumann's collection included 1,000 specimens of mammals, 1,300 of birds, 30,000 of insects, 2,000 mollusca, besides reptiles, fishes, etc. Twelve mammals and ten birds had already been described as new.

On the 16th ult. Dr. M. A. STEIN read a paper on "Geographical and Archaeological Explorations in Chinese Turkestan." Sir CLEMENTS MARKHAM presided. Dr. Stein said that the idea of explorations about Khotan was suggested by the discoveries of M. de Rhins, the French explorer, and Dr. Sven Hedin's march of 1895, which was first made known in 1898. With the help of the Indian Government, Dr. Stein was enabled to set out in April, 1900, and reached the capital of the Hunza chief in June. In that city the carved woodwork exhibited the features of old Indian decoration, while in the Mir's residence the furniture and fittings were Chinese in type.

Arriving at Tashkurghan, Dr. Stein was enabled to prove the identity of the territory of Kir-p'an-to with the modern Sarikol. A fresh start was made from Kashgar in September, and Khotan was reached in October. From this point a survey was made of the Yurungkash, flowing between ranges of lofty peaks of 23,000 feet high, and connected with certain recognised peaks in the Indian triangulation.

After beginning excavations in December, the first find of importance was some leaves of manuscript in Sanskrit, which might be assigned to the sixth century. In addition, there were documents in non-Indian characters, which represented the indigenous tongue of Khotan. The discovery of Chinese writings dated 778-787, as well as coins of about 720, seems to show that Dandan Uiliq was abandoned at the end of the eighth century. The district was probably irrigated by canals bringing the hill water to the desert, and no adequate cause could be assigned for its desertion. An older town was discovered in the desert north of Iman Jafar, where tablets were unearthed bearing the ancient Indian script Kharoshthi.

The area over which ruins are scattered is about eleven miles by four, and the buildings were constructed in a massive style of beams of wood and plaster, which has served to keep the tablets in a high state of preservation. There were also pieces of pottery of great antiquarian interest, and writing in various writings. The clay seals with which the tablets were fastened show the influence of Western arts, and include figures of Pallas Athene, Eros, and portraits with classical modelling and barbarian features.

The discoveries corroborate the evidence of early Chinese explorers that these lands were colonised by immigrants from the Punjab about 200 B.C. This district must have been deserted before the fourth century, as there were no signs of writing on paper, which became common in Turkestan at that date. At Rawak a remarkable series of statues in stucco and smaller *relievos* between was discovered, which had evidently been painted as well as carved. These showed a close affinity to the Græco-Buddhist sculptures of the North-West Frontier of India. Returning to Khotan, Dr. Stein obtained a confession from Islam Akhun, who had sold a great number of manuscripts in unknown characters, that these works were entirely forgeries.

Indo-European Telegraph Department.—The administration report of this department for 1900-1901 has just been issued. The total capital outlay to the end of that year was £771,680, and the net result of the year's working was a profit of £60,580, representing a dividend of 7·85 per cent. There was no interruption of traffic between Teheran and Karachi during the year, but between Teheran and London the lines were interrupted for a total period of rather over three days. There were 560 acts of wilful damage on the Persian section. Soon after his return from Europe the Shah issued a firman to the local governors urging the necessity for energetic action in protecting the line, but the result has not been satisfactory. Interruptions on the Turkish route occurred amounting to about 37 days, and the working of this route continues to be unsatisfactory. The Teheran-Meshed line of 568 miles, owned by the Persian Government, but maintained by the department, worked smoothly, the interruptions aggregating only 24 hours. The increased message revenue of the year was chiefly owing to the war in China. Message statistics show that during the five years to March 31, 1901, the average number of messages sent each year on behalf of *The Times* was 186, while the total number of words averaged 44,934, the corresponding figures for other press messages being 1,108 and 53,235. *The Times* messages, averaging 242 words each, therefore, were five times as long as other press messages. The average length of commercial messages was 12·95 words. The new convention between England and Persia provides that in addition to the existing line from Teheran to India *via* Bushire, the Persian Government shall construct under the supervision of the British Telegraph Staff a three-wire line from Kashau to the Baluchistan frontier *via* Yazd and Kerman, traversing, wherever possible, inhabited districts. The Persian Government agrees to lease the use and the transit revenue of the line, when completed, to the Indo-European Telegraph Department, which will provide for its maintenance and direction, though the line guards are to be Persian subjects.—*Times*.

COMMERCIAL INTELLIGENCE DEPARTMENT.

CORRESPONDENCE AND ENQUIRIES.

The following are given as specimens of some of the enquiries which have been addressed to, and satisfactorily answered by, the Institute during the past month (June).

* * All communications must be authenticated by the name and address of the writer. Enquiries which would involve special applications or expense will be a matter of arrangement with the correspondent.

- A. G. E. & Co., London.—Building bye-laws of Johannesburg.
C. C. Co., London.—Duty on carriages entering Australia.
S. C. & Co., Liverpool.—Shippers of certain produce in Sicily and Holland.
C. B., London.—Climate and cost of living in West Australia.
F. B. W., Reading.—Agriculture in Australia and New Zealand.
H. V., Cambridge.—Fibre-extracting machines.
W. W., London.—Process for "oxydising" metals.
W. R., Aberdeen.—Civil employment in Egypt.
W. C. P., London.—Enquiry for coarse manioc flour.
J. M., London.—The Moreton-bay fig tree.
A. V., London.—Maltese lace.

REQUIREMENTS REGISTRY.

In order to provide correspondents with an opportunity of making known special "wants" or "needs" in the British Colonies, India, and Foreign Countries, space will be regularly devoted to the publication of approved notices in the IMPERIAL INSTITUTE JOURNAL. Notices, as a rule, should not exceed 25 words in length, for which a charge of 2s. 6d. will be made for each insertion. Special arrangements can be made for longer notices.

SPECIMENS OF FOREIGN AND COLONIAL WOODS desired. Purchase or exchange. Names and localities must be well authenticated. Address—HERBERT STONE, BRACEBRIDGE-STREET, BIRMINGHAM.

THE CURATOR OF THE CANADIAN SECTION OF THE IMPERIAL INSTITUTE is prepared to furnish information about Canadian Trade and to supply names of importers, manufacturers, shippers, etc.

The following trade enquiries have been received at the Canadian Section of the Imperial Institute, from the Curator of which Section further particulars may be obtained :—

Home Enquiries.—A London firm wishes to hear from Canadian producers of pine wool accompanied by samples and quotations.

A firm of wholesale and export stationers is prepared to appoint suitable Canadian resident agents.

A company manufacturing electric lights and all kinds of electrical materials and appliances desires to be placed in communication with Canadian firms willing to introduce their goods.

A company manufacturing tiles, bricks and fireclay goods, wishes to hear from Canadian importers of these classes of goods.

Canadian Enquiry.—A Canadian jewellery manufacturing company asks to be placed in communication with United Kingdom manufacturers of enamel, of which it uses considerable quantities.

MAPS AND CHARTS.—RECORDS.

[The entire collection of maps (with the exception of a few atlases and maps issued by private firms) consists of authoritative publications of the various government cartographical departments. Such as: the One-inch Ordnance Survey of Great Britain and Ireland, a complete set of Admiralty Charts, and a selection from the maps compiled in the Intelligence Division of the War Office; the monumental "Indian Atlas," and a large number of the publications of the Surveyor-General's Office, Calcutta; the Geological Survey of Canada, and the Government Surveys of Victoria and New South Wales. In the arrangement of the collection, the geographical classification of the War Office Intelligence Department catalogue has, with some modifications, been followed.]

ADDITIONS TO THE COLLECTION OF MAPS DURING MAY, 1902.

AFRICA.

I.D.W.O.

EAST AFRICA, No. 1359 :—Yola, North-West Somaliland.
BRITISH CENTRAL AFRICA, No. 1479, provisional, 9 sheets.

Presented by the Director-General of Mobilization and Military Intelligence.

CHARTS AND PLANS.

Published by the Hydrographic Department, Admiralty, during March and April, 1902; J. D. POTTER, Agent, 145, Minorities, London, E.C.

- No. *New Charts.*
31 England, south coast :—Fowey harbour. Mevagissey harbour.
3168 Scotland, west coast :—Eigheig More to Black Leversay. (Plans :—Peter's Port. Loch Carnan).
3220 France, south coast :—Cape Ferrat to Bordighera.
3219 Italy, west coast :—Bordighera to Oneglia.
2097 West Indies. Trinidad island :—Bocas de Dragos. Port of Spain.
3181 China. Plans of anchorages in the Yang tse kiang :—Silver island. Wuhu anchorage.
3182 China. Plans in the Yang-tse-kiang :—Havoc and Ella rocks. Lee rocks. King kau rocks.
3183 China. Plans in the Yang-tse-kiang :—Mopanshih. Chenglin reach.
3225 Japan :—Simonoseki strait to Maruyama Zaki.
3169 Australia, south coast :—Port Phillip to Gabo island.
1416 Anchorages on the north-west coast of New Guinea.
3269 North Pacific ocean :—Plans in the Gilbert islands.
369 Plans in the Cape Verde islands. Plan added :—Port Ponta do Sol.
1312 South America. Plans on the coast of Chile. Plan added :—Tongoi bay.
3031 Bays and anchorages on the east coast of Borneo. New plan :—Sangkulirang bay. Plan added :—Kaniungan islands.
2662 Celebes. Ports in Makassar strait. New plan :—Barito river.
2169 Islands in the North Pacific. New plans :—Midway island. Seward road and Welles harbour.
1490 North Pacific ocean. Harbours and anchorages in the Sandwich islands. New plan :—Kaunakakai harbour.

Charts that have received additions or corrections too large to be conveniently inserted by hand, and in most cases other than those referred to in the Admiralty Notices to Mariners.

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|--|--|
| No. | No. |
| 1934 England, east coast :—River Tyne entrance. | 589 British Columbia :—Esperanza and Nuchatlitz inlets. |
| 1626 England, east coast :—Blyth. | 386 Africa, west coast :—Princes, San Thomé, and Anno Bom islands. |
| 1142 Scotland, east coast. Firth of Forth :—St. Abb's Head to Edinburgh. | 1235 Persian gulf :—Mouth of the Euphrates. |
| 126 Heligoland. | 575 Bay of Bengal :—Madras to Ramapatam. |
| 2310 Norway, sheet viii. :—Dønnæsö to Fleina. | 2637 Celebes :—Strait of Makassar, south part. |
| 2962 Arctic Russia :—North cape to Einsamkeit island. | 2577 Philippine islands :—Between St. Bernardino and Mindoro, with adjacent islands. |
| 144 Arctic Russia :—Gulf of Ob. | 2454 Philippine islands :—Northern portion of island of Luzon. |
| 1400 Spain :—Gibraltar. | 2809 China, north-east coast :—Yang tse kiang. |
| 1233 Italy :—Castellamare bay, etc. | 2849 China, sheet iv. :—Hankau to Yoh chau fu. |
| 2233 Black Sea :—Kustanjeh anchorage. | 2119 Australia, east coast :—Newcastle harbour. |
| 2235 Black sea, sheet vi. :—Fort Anakria to Kertch strait. | 1674 Australia, east coast :—Brisbane river. |
| 2686 St. Lawrence river :—Caraquette harbour. | |
| 411 Cuba :—Anchorages on the north coast. | |
| 1380 Cuba :—Nipe Bay. | |
| 2859 San Domingo. Plans on the south coast :—San Pedro de Macoris bay. | |

THE MINERAL RESOURCES OF GREECE.

A new significance and impetus has been given to the mining industry in Greece of recent years, owing to the increased demand for metals of all kinds, and more especially for iron, copper, and lead ores, in which the country is apparently so rich.

In a recent Foreign Office Report (Misc. Series No. 576), the Commercial Attaché to H.M. Legation at Athens, makes the following observations :—

It is certainly astonishing that, in spite of the success achieved by those companies already working in Greece, foreign capital has as yet taken so little interest in the mineral development of the country. The results obtained at Laurium speak for themselves. The output of these mines has become a significant factor for the European market. But the mineral wealth of Greece is not confined to Laurium. The researches and reports of geologists and other experts clearly demonstrate that the mineral deposits are generally distributed throughout the country, more particularly on its eastern side. It is true that mining companies have frequently failed in Greece, but an investigation of the circumstances will generally show that failure was due to want of adequate capital. Companies, on the other hand, which commenced operations on a sound financial basis, are meeting with success and paying substantial dividends.

The fact that foreign capital has hitherto fought shy of Greek mining undertakings arises, perhaps, rather from a want of confidence in the country, than from credulity as to the extent of its mineral resources. Of recent years Greece has been passing through troublous times, both of a financial and political nature, and the moment has certainly not been opportune for the attraction of foreign capital.

Again, the difficulty connected with the acquisition of new concession has undoubtedly acted hitherto as a check to mining enterprise. As already pointed out, the applicant for a mining concession may be kept in suspense for years as to the result of his application. Since 1898 the Government has received application for about 1,000 concessions, of which up to the present time less than 50 have been granted. Assuming that on an average merely 5 per cent. of the concessions sought are of real value, this alone would give some indication of the mineral wealth of the country.

Many mining possessions in Greece are held by people who do not possess the necessary capital for working them, and who are trusting to an eventual sale or lease of their rights. These concessions, then, are practically on the market, and the working of many of them might give lucrative results. In addition to individual concession-holders of this category, it is worthy of note that there is a small syndicate of foreigners in Athens who have, of recent years, made exhaustive researches in connection with the various concessions in their hands, and have established an office in London for the express purpose of supplying information to British capitalists.

Labour is very cheap in Greece, and the present population intelligent, well disposed to foreigners, and quite free from the Socialistic tendencies of the age. All mines at present working in this country employ native labour, and, as far as can be gathered, with most satisfactory results.

The events of the last few years seem to indicate that Greece is now entering upon a period of greater tranquillity and prosperity, and it is to be hoped that in the peaceful economic development of the country the mining industry may meet with that attention which it certainly deserves.

MOTOR WAGGONS FOR INDIA.

In an article on the possible use of motor waggons in India, *Indian Engineering* of 26th April states that the recent trials at Liverpool and Aldershot have proved that a load-carrying vehicle weighing but a few tons can be and is being made, which can not only travel on ordinary roads, but can negotiate any incline likely to be found thereon, and can besides be run across country, traversing any ground that would be practicable for an ordinary farm wagon. A large number of these motor waggons are in daily use by commercial firms, and this number is constantly increasing. Indian roads are at least as good, if not better than the average English highway, and it seems well worth while to investigate the economical applicability of the new vehicle to use in India.

If the waggons can be run economically, *i.e.*, at a less cost than bullock carts, and if they are trustworthy, and not liable to break down in ordinary work, their use as assistants and pioneers to railways would be advantageous in many ways. If a railway could be laid experimentally for a time, and shifted without cost when the most favourable alignment had been ascertained, much subsequent loss might be avoided, and many millions saved for the service of the country's needs. But a railway must stay where it is put, any alteration is an expensive business, and loss of traffic must often be borne in preference to burdening the capital of the line with the cost of re-alignment. Then the construction of a railway is so costly that a large tract of country can only bear the expense of one line, and traffic points must often be left to one side. A road is a cheap affair to maintain when once constructed, to say nothing of its comparatively small cost in construction, while railways are extremely expensive in the former respect.

The use of motor waggons on roads for traction purposes overcomes these drawbacks. If one route is found not to be paying, it costs very little to change to another. If it becomes evident that a tract of country is not rich enough in traffic to support the motor, it can be loaded on a railway wagon, and taken elsewhere. Capital will have lost nothing but perhaps the cost of a few temporary sheds. The motor can not only run along the highway, but can penetrate the country on either side, and can reach almost any place accessible to the bullock cart. Railways lose much traffic because the merchant finds it as cheap to run his carts 20 miles, as to run them ten; this would not apply to the motor, which could be loaded at the doors of his godown.

For these and other reasons, motor waggons, if they could be run at the same cost per mile as bullock carts, would have a wide field of usefulness in India. The roads, taking them all round, are well above the average of English roads, and more level, as many of them have been built with the same care as a railway, and the gradients are easy and regular, even in hilly districts.

The writer of the article goes on to say :—"We do not advocate the use of these waggons in competition with railways, under separate management, but think they should be owned and run by the railways which they serve, and under similar traffic rules."

"The fact that the same agency could take the goods up at the customer's door, and deliver them at any distance, would go far to assure the success of the motor wagon in competition with the cart. But when traffic rises to the point at which a railway can deal with it, the railway should be built. The motor wagon is fitted for two purposes in connection with railways : for pioneer work where there is any doubt as to the paying of a railway, and as a feeder where a railway is impossible."

The Cauveri Falls.—The *Engineer* gives a description of the carrying out of the scheme for the distribution of power obtained from the Cauveri Falls in Mysore, stating that the project which is now near completion will form the largest undertaking of its kind in the British Empire. The scheme consists in utilizing a part of the great natural power running to waste at the Cauveri Falls, and applying the power to driving the mining machinery, stamps, crushers, air compressors, pumps, etc., used throughout the Kolar goldfields, situated at nearly 100 miles' distance from the falls. The Cauveri Falls have long been celebrated for their great natural beauty; they are situated on the Cauveri river, 62 miles south-west of Bangalore. The Cauveri, one of the greatest rivers in Southern India, forms at this point the boundary between the native State of Mysore and the Madras Presidency, and supplies water for irrigation to an endless network of channels taking off from low masonry dams thrown across its bed at intervals.

NEW BOOKS, etc.

HARRISON AND SONS. (London, 1902.)

The Colonial Office List for 1902, comprising Historical and Statistical Information respecting the Colonial Dependencies of Great Britain, an account of the services of the Officers in the Colonial Service, a transcript of the Colonial Regulations, etc. With maps. Compiled by W. H. MERCER and A. E. COLLINS. Forty-first publication. Ry. 8vo., pp. xxvi + 538. (Price, 10s. 6d.)

The present edition of the *Colonial Office List* has been carefully revised, and the statistical information has been brought up to the latest date possible. The volume increases in bulk yearly, with the addition of new matter, and, as it is compiled from official records, it may be regarded as authoritative on all colonial questions. The particulars respecting the new colonies of the Orange River and the Transvaal, will be found interesting, as also the account of Northern and Southern Nigeria. A *resumé* of the Constitution of the Commonwealth of Australia is given on page 4, followed by the official Establishment of the Commonwealth and lists of the members of the Parliament. The volume conveys an epitomised account of our Colonial Empire, which now has an area of more than 9½ millions of square miles, or 80 times that of the United Kingdom, and a population, not including that of the Niger and Oil Rivers territories, of about 24 millions. As a record of the development and resources of the Colonial possessions the *List* is most useful for reference; every dependency of the British Empire, except India, is dealt with as regards conditions, resources and government. The contents of the present issue, as compared with the edition of forty years ago, will indicate the vast expansion that has been made in the Empire during that period. The numerous maps inserted throughout the volume are well and clearly drawn, and add greatly to its value and utility.

CASSELL AND COMPANY, LTD. (London, 1902.)

The Real Siberia, together with an account of a dash through Manchuria. By JOHN FOSTER FRASER. Illustrated. 8vo., pp. 279. (Price, 6s.) This volume contains personal impressions of a journey made across Siberia and through Manchuria in the autumn of 1901. The journey was made over the new Siberian railway, travelling by an ordinary daily train from Moscow to Vladivostok, with a hurried trip into Manchuria, where the author visited the great prison at Alexandrovski. Mr. Fraser's experience as a traveller is extensive and varied, so that even in this rapid transit he has collected many curious bits of information. His views respecting Siberia are on the whole very favourable, and he considers that there is a great future in store for this long-neglected country. He regards it as the ultimate great food-producing region of the earth. "The Siberia of convicts and prisons is passing away, and the Siberia of the reaping machine, the gold drill, the timber yard, the booming, flourishing new town, is awakening into life." Instead of a gaunt lone land, which has been the commonly received notion, the country reminded him from the first day to the last of Canada and the best parts of Western America. The book is written in a graphic and lively style, and there are no dull pages to be found in it. The numerous illustrations, which are from photographs, convey an excellent idea of the scenery and people of this immense region, which is now being opened up to trade and commerce and receiving a large increase to its population.

CHARLES GRIFFIN AND COMPANY, LTD. (London, 1902.)

Gold-seeking in South Africa. A Handbook of hints for intending explorers, prospectors, and settlers: with a chapter on the Agricultural Prospects of South Africa. By THEO. KASSNER, Mine Manager. With maps and illustrations. 8vo., pp. 134. (Price, 4s. 6d.) This little volume treats of the author's personal observations and experiences during his travels in South Africa, and its publication at the present time is specially opportune, in view of the resumption of mining work and development in the Transvaal. The book will be of great service, from a practical point of view, to intending prospectors and settlers, in searching for minerals and developing the mines on either a large or small scale. The introductory chapters give a general description of the rocks, descriptions of the various goldfields and of the several reefs, with the author's observations on them. The volume is well illustrated with diagrams and maps, explanatory of the text, and concludes with a chapter on the climate and agriculture of the country.

The Textile Fibres of Commerce. A Handbook on the occurrence, distribution, preparation, and uses of the animal, vegetable and mineral fibres used in cotton, woollen, paper, silk, brush, and hat manufactures. By WILLIAM J. HANNAN. Illustrated. La. 8vo., pp. 236. (Price, 9s. net.) This book is designed to give information concerning the Textile Fibres that are used in the various industries of the world. The vegetable and mineral fibres of commerce are now very numerous, so that there is great need for an accurate and complete description of these fibres, the processes by which they are obtained, and the purposes for which they are used in the different industries of commerce. The compilation of the work has been carried out with evident care, and the numerous illustrations add materially to the utility of the volume for reference. Most of them are from photographs or sketches from actual specimens, made by the author and his friends. To those interested in fibres the work will be most valuable.

GEORGE PHILIP AND SON, LTD. (London, 1902.)

Philips' A.B.C. Pocket Atlas-Guide to London. Coronation Year Edition. 8vo., pp. 86. (Price, 1s.) This handy guide will be very useful to visitors and strangers in London, especially during the present year. The main feature of the little book is an atlas consisting of 24 coloured maps, 18 of which are sectional maps of the whole of London on the scale of 2 inches to the mile. In addition there are six supplementary maps which show the divisions of London into metropolitan boroughs, the various railway systems, and the environs of London. The guide portion of the book is principally devoted to an A-B.C. gazetteer or list of the principal buildings, and "sights" of London, with descriptive notes. The excellent photographic views are deserving of mention, and the size of the volume is adapted for carrying in the pocket.

HARPER AND BROTHERS. (London and New York, 1902.) *Harper's International Commerce Series.* Edited by Francis W. Hirst.

British India and its Trade. By H. J. TOZER, M.A. 8vo., pp. xiv + 90, with map. (Price 3s. 6d.)

Japan and its Trade. By J. MORRIS. 8vo., pp. xvi + 182. With map. (Price 3s. 6d.)

The object of this series is twofold: first to supply managers, clerks and agents of commercial firms in all parts of the globe, with accurate information about the commerce, resources, and needs of the principal countries of the world; and secondly "to supply to teachers and students in technical schools, colleges and commercial Universities throughout the British Empire and the United States of America, guide-books to the wealth of modern nations." Such a series is specially needed at the present time, and will prove a useful aid in the advancement of commercial education, to which attention is now strongly directed. The series will provide guidance to an acquaintance with the modern conditions under which nations are competing for the world's markets, exchanging their products, utilizing their own agricultural and mineral resources, and, as they progress in wealth and population, making new and larger demands upon the products of other countries. In his account of British India and its trade, Mr. Tozer describes the physical features and population of the country, and the sources of its wealth, agricultural, mineral, and industrial. Full statistical tables are given of the import and export trade, and also the Customs tariff and regulations. There is also a chapter on the weights and measures, currency, exchange and banking of the country, which will be useful to the merchant. Mr. Morris's account of the trade and resources of Japan is specially valuable and useful in view of the treaty recently made with that country. The statistics given in this book show the commercial importance of Japan, in its geographical position as well as in its internal resources. Japan's immediate need is that of ready capital to prosecute her various enterprises. The volume will enable the merchant and manufacturer to judge of the possibilities which are in store for those who may embark in trade with that rapidly rising land of the Far East.

WALTER R. SKINNER. (London, 1902.)

The Mining Manual for 1902. By WALTER R. SKINNER. Sixteenth year of publication. 8vo., pp. lvii + 1696. (Price, 21s.) This useful and valuable annual now contains over 1,700 pages, and its increasing size shows the growth of public interest in mining undertakings. The value of the work to investors is largely increased, particularly by the resumption of work on the Rand, and the formation of new mining companies. The volume contains a complete record of the work and operations of mining and kindred companies, in a condensed and handy form for reference. The particulars in every case are brought down to the latest date, and the matter is so arranged that the constitution, the financial position, and the administrative equipment of each company are clearly shown. Embracing all sections of the mining market it forms the most comprehensive work on the subject. The book has been carefully revised, so as to ensure reliability and accuracy. The information is classified, as in previous issues, into four sections; and particulars are given of 3,523 companies, of which 688 are Australian, 855 South African, 420 West African, and 1,560 miscellaneous. The lists of Directors and Secretaries include the names of about 7,000 Directors and of 1,720 Secretaries, with the companies each is interested in. A useful dictionary of mining terms is appended to the volume.

THE CLARENDON PRESS, OXFORD. (London, Henry Frowde.)

Studies in History and Jurisprudence. By JAMES BRYCE, D.C.L. In two volumes. La. 8vo. Vol. I., pp. xxi + 553; Vol. II., pp. xvi + 543. (Price, 25s. net.) These volumes contain a comparison between the history and law of Rome and the history and law of England, as regards the extension over the world of their legal systems, their constitutions, legislation, and private civil law. Two of the essays embody an effort to examine political constitutions generally from comparatively unfamiliar points of view, and five are devoted to the discussion, in a non-technical way, of problems in jurisprudence which have both a theoretical and a historical—to some extent also a practical—side. An interesting outline is given of the early history of Iceland and the very peculiar constitution of the primitive Icelandic Republic. There are also chapters on modern constitutions and reflections on the history and constitutions of the United States. The systems of government that obtained in the two late Dutch Republics in South Africa are described, and also the constitution recently created for the new Commonwealth of Australia. The student of history will find these volumes of great service in acquiring a knowledge of the constitutional and legal element in history, and the growth of constitutional government in the world. The studies are well and exhaustively worked out, and are marked with the well-known acumen and clear-sightedness of the author; they are valuable contributions to the literature of the subject.

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The CITY BRANCH OF THE IMPERIAL INSTITUTE embraces:—

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- Market reports, prices-current, official reports and statistics.

The City Branch is in constant communication, by telephone and messengers, with the Imperial Institute, South Kensington. Curators and other members of the Imperial Institute staff will attend at the office at stated times and by special appointment, to deal with enquiries and to assist in establishing or facilitating business relations with mercantile houses, etc., in the Colonies and in India.

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- The News Room is *free to Fellows* of the Institute, as is also the Enquiry Office for the supply of such information as does not involve special research or correspondence.
- A *subscription* of the sum of one pound per annum, payable in advance, secures the *free use* of the News Room, and the supply, free of charge, of information not involving special research or correspondence.
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 - First enquiry*, not involving special research or correspondence, *free*.
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 - For each enquiry, involving special correspondence, or reference to home-experts, etc., *five shillings*.
 - For each enquiry involving Colonial or Foreign correspondence, *ten shillings*, or by special arrangement, if likely to be voluminous.
- Subscribers* will have to pay the charges specified under (c) and (d) in the foregoing clause, and *Fellows* will have to reimburse the Institute any out-of-pocket expenses incurred in connection with enquiries coming under those heads.
- The Information Office will undertake to obtain analytical or other examinations of samples by competent Experts, upon payment, by persons submitting them, of the usual professional fees, to be previously specified, and agreed to by the applicant.
- The Institute will undertake the supply, at cost price, of translations, into any language, of trade circulars, prices-current, etc., the conversion of weights, measures, coinages, etc.

MONTHLY COMMERCIAL AND INDUSTRIAL SUMMARIES.

GENERAL COMMERCE AND INDUSTRY. COLONIES.

Canadian Lake Superior Region.—"While it may be possible that on account of the glacial erosion the product of high grade ore in Canada may be less than in the districts of similar size and geological position on the United States side of the boundary," say Mr. C. R. Van Hise in a report on the Lake Superior ore region to the United States Geological Survey, "it cannot be doubted that in the future important quantities of iron ore will be exploited in the Canadian Lake Superior Region. Doubtless, also, this exploitation would have begun many years ago were it not for the duty which ores mined in Canada must pay when entering the United States. The Vermilion iron-bearing series has been traced to Hunters Island. Thence these rocks have been mapped by the Canadian Survey as extending first in a north-easterly and then in an easterly direction to the Kaministiquia river, and thence eastward to the Keneenawan rocks west of Lake Nipigon. Another great belt of iron-bearing rocks with various ramifications has been traced by the Canadian Survey from Rainy Lake eastward to the Canadian Pacific railway and to Lac des Mille Lacs. In this belt occurs the so-called Atikokan range, in which large deposits of iron ore are said to outcrop. East and north of the east half of Lake Superior various areas of iron-bearing rocks are also found. One or more belts are said to extend east from Lake Nipigon. A belt is found adjacent to Black and Pic rivers. Several belts of iron-bearing formation have been found in the Michipicoton district. At the present time the only one of these districts which is an ore producer is the Michipicoton. While this district has not been connected areally and structurally with any other area in the Lake Superior region, the likeness in the character of its rocks and its succession to the Vermilion district leaves little doubt that the two districts are in most essential points parallel. In the Michipicoton district the basement rock is a greenstone, showing the ellipsoidal structure on the great scale so characteristic of the Ely greenstone of the Vermilion district. It contains substantially all the varieties of material in the iron formation of the Vermilion district, and in addition great quantities of pyritic quartz rock. On the bluff back of the Helen mine and at many other places iron carbonate is abundant. Near the Helen mine Mr. Merriam reports this carbonate as containing 19 to 30 per cent. metallic iron. These abundant cherty carbonates leave little doubt that the ferruginous cherts, ferruginous slates, jaspers and mine ores have mainly developed from a carbonate as the original rock, precisely as in the various districts south of Lake Superior. However, it is clear that the pyrite of the carbonates and the pyritic quartz rocks have also made contributions. At the present time the iron formation has been developed only at the Helen mine. Here a good body of high-grade hematite has been shown by stripping to extend in considerable areas to the rock surface. In 1900, the first year of shipment, 62,000 tons were shipped.

Hong Kong.—SHIPPING AND TRADE.—It appears from the Harbour Master's report that the total tonnage entering and clearing during the year 1901 amounted to 19,325,384 tons, being an increase, compared with 1900, of 880,248 tons, and being also in excess of any previous year. Of this increase 165,128 tons are due to the fact that steam launches trading to ports outside the colony have been included this year, whereas in former years they have been returned separately. There were 45,349 arrivals of 9,681,203 tons and 45,171 departures of 9,644,181 tons. Of British ocean-going tonnage 2,917,780 tons entered and 2,897,200 tons cleared. Of British river steamers, 1,697,242 tons entered and 1,701,417 tons cleared, making a grand total of British tonnage of 9,213,639 tons entering and clearing.

TRADE.—The information under this heading is still less accurate than it might be if greater assistance was given by those from whom the particulars are obtained, and who alone are in a position to afford it. The following returns must therefore, be received with due allowance for this apparent indifference to accuracy. The principal features to be remarked in the reported trade of the port for the year 1901 are:—

1. A decrease in the coal imports of 12.3 per cent.
2. A decrease in the cotton imports of 27.8 per cent.
3. A decrease in the rice imports of 8 per cent.
4. A decrease in the timber imports of 18.7 per cent.
5. A decrease in the hemp imports of 42.3 per cent.
6. An increase in the general imports of 9.8 per cent.
7. Also small increases in case and bulk kerosene, and in liquid fuel.

A comparison of the principal imports of 1900 and 1901 works out as follows:—

Articles.	1900.	1901.
Coal	1,045,812	917,144
Rice	673,029	618,780
Sugar	238,863	241,291
Flour	145,111	145,287
Kerosene (bulk)	64,732	70,728
" (case)	69,979	77,977
Timber	82,311	66,860
Hemp	54,105	31,195
Cotton yarn and cotton	19,993	14,423

Newfoundland.—MINERAL PRODUCTION.—The annual report of the Mines Bureau of Newfoundland shows that in every instance there was an increase in the production of last year over that of 1900, the most important improvement being in iron ore, the output of which more than doubled, while the copper shipments increased only by 4,734 tons. The value of the total output shows an increase of over 50 per cent. over that of the preceding year, which is largely attributed to the increased iron shipments from the Belle Island. A deposit of pyrites near Ramah, Labrador, is reported to be of excellent quality and of great extent. The chief market for the slate shipments, which amounted last year to 2,000 tons, is found chiefly in this country. Borings have been made for petroleum, but without any considerable success. Among other minerals mentioned which are known to exist are chrome ore, manganese, lead, arsenical pyrites, mica, and asbestos. It is claimed in addition that gold also could show a considerable production, and it is believed that coal also exists on the island, and should it be discovered in commercial quantities an iron and steel industry would be established.

FOREIGN COUNTRIES.

Peat.—The occurrence and uses of peat are described in *Mineral Resources of the United States*, 1901. There are probably no large areas of peat in the United States equal to those found in Ireland and Northern Germany, but many small deposits exist, some of which may cover several hundred acres. Except in the case of those close to the Canadian border, most of these peat deposits are probably rather high in ash or mineral

matter. These impure peats or muck make a very rich soil. The peat is at times underlain by marl, or in rarer instances by bog iron ore. The best known use of pure, or nearly pure, peat is a fuel, but with wood and coal so cheap no successful attempts have been made in the United States to utilize it for this purpose. Peat can also be used in the manufacture of gas, alcohol and charcoal. On account of its fibrous character it can even be successfully worked up into paper, cloth or rope. The partly decomposed moss has valuable antiseptic properties, and under the name of moss litter is sold for bedding in stables. The growing moss is also used as packing material. It is in the three last-mentioned applications that the successful use of American peat is probably to be looked for. Curiously enough, peat for packing purposes is sent from Holland to the United States, where it is used for packing American wines, which are then exported to Europe. The peat industry of the United States seems as yet not to have got beyond the experimental stage.

LABOUR MARKET. UNITED KINGDOM.

General Statistics.—According to the *Labour Gazette*, employment in May showed little change on the whole as compared with April. As compared with a year ago there was an improvement in the textile and pig iron industries, but a decline in the engineering and shipbuilding trades. Decreases in wages affecting 250,000 coal-miners were reported during the month. In 224 trade unions, with an aggregate membership of 549,023, making returns, 21,926 (or 4.0 per cent.) were reported as unemployed at the end of May, as compared with 3.6 per cent. in the 216 unions, with a membership of 544,460, from which returns were received for May, 1901.

TRADE DISPUTES.

Twenty-three fresh disputes began in May, involving 7,385 workpeople, of whom 6,623 were directly, and 762 indirectly affected. The corresponding number of disputes in April was 32, affecting 3,635 workpeople, and in May, 1901, 64, affecting 8,039 workpeople. Of the new disputes in May, 1902, 7 took place in the building trades, 9 in the mining industry, 3 in the metal, engineering and shipbuilding trades, 2 in the textile trades, and 2 in the transport trades. Of the 21 new and old disputes, affecting 11,818 workpeople, of which definite results were reported, 5 were decided in favour of the workpeople, 10 in favour of the employers, and 6 were compromised.

CHANGES IN RATES OF WAGES.

The changes in rates of wages, reported during May, affected 259,442 workpeople, and a net effect of all the changes was a decrease averaging 8½d. weekly per head of those affected. Of the total number, 2,647 received advances, and 256,795 sustained decreases. The changes of the previous month affected 12,947 workpeople, the net result being an increase averaging 4½d. weekly per head. During May 1901, the number affected was 375,756, and the net weekly result was a decrease of 1s. 5d. per head. The principal decreases were those sustained by 242,500 coal miners in Durham, South Wales and Monmouthshire. One change, affecting 107,500 workpeople, was arranged by a Conciliation Board, one affecting 1,000 workpeople was arranged by arbitration, and three changes, affecting 136,810 workpeople, took effect under sliding scales. Two changes, affecting 155 workpeople only, and the remainder, affecting 13,977 workpeople, were arranged directly between employers and workpeople, or their representatives.

COLONIES.

The monthly report, compiled by the EMIGRANTS' INFORMATION OFFICE, states as follows:—**Canada.**—Speaking generally men are well employed at this time both in towns and in country districts, but the labour market is unsettled in many parts owing to numerous strikes for higher wages and shorter hours, and the increasing cost of living. The most serious of these strikes was that of the longshoremen at Halifax; this has now been settled, and wages have been fixed at 20 cents an hour, and 25 cents at night. A report from Montreal states that there is a large demand for good farm hands, general labourers, navvies, and for female domestic servants, especially general servants and cooks. Reports from Battleford, Prince Albert and other places in the North-West state that there is a good demand for farm and general labourers, female servants, and a few carpenters. In British Columbia there is exceptional activity in the logging, lumbering, and shingle industries, but at the important mining town of Rossland there are "plenty of labourers of all kinds at present," and at the large coal mines of Nanaimo, though the mines are working steadily, many men are idle, and prospects are very unsettled.

Australasia (New South Wales).—A report from Cooma states that the supply of labour—with the exception of female servants—is in excess of the demand. Country districts are suffering severely from the long drought, though rain has fallen in parts; miners are very slack at the Broken Hill silver mines, and many are out of work. (**Victoria.**)—The supply of labour is sufficient—except in the case of female servants and competent farm labourers and milking hands. (**Queensland.**)—There is a demand for ploughmen and farm labourers in the South. There is no demand for more miners anywhere, and very little for mechanics. Female servants are wanted. (**Western Australia.**)—There is a good demand in the south for farm labourers and female servants, and for a few mechanics in the building trades; there is no demand for miners anywhere. (**Tasmania.**)—The only demand is for skilled farm hands, and for a few mechanics, such as fitters, on the West Coast. (**New Zealand.**)—The building trades are busy except at Wellington; work in the engineering trades is general, except at Wellington and Invercargill; the clothing trade is fairly brisk, especially at Dunedin; the boot trade is moderately busy; coal-miners at Westport have been busy; there has been plenty of work in the flax mills; more general labourers are not wanted during the slack season.

South Africa (Cape Colony).—There is a good demand for mechanics, especially men in the building trades; but no one can land without first obtaining a permit from the Permit Office, 47, Victoria-street, London, S.W. The General Manager of the Railways reports that a limited number of engine-fitters, boiler-makers, coach-builders, coach-painters, firemen and waggon-builders, and a few iron-moulders, iron turners, copper-smiths, blacksmiths and trimmers would probably secure employment by applying at the Government workshops in Cape Town; the contract would be for at least one year at 9s. to 11s. a day; applicants must pay their own passages. Railway clerks, shunters and train foremen also are wanted; the cost of their passages will be advanced, if necessary, and be recovered out of wages; clerks begin at £120 or £132 a year, according to qualifications; application must be made by letter only to the Agent-General for the Cape of Good Hope, 100, Victoria-street, London, S.W. Recruiting in this country for the Cape Mounted Rifles has re-commenced; apply to the Agent-General as above. (**Natal.**)—There is a good demand at the present time for skilled artisans, more especially for carpenters and those

in the building trades, but they cannot land without permits, which may be obtained at the Permit Office, 47, Victoria-street, London, S.W. The carpenters' strike is now settled, the men agreeing to accept an increase of 1s. a day (bringing their wages up to 15s. a day) instead of 2s. as at first demanded. The following persons are wanted for the Government railways; free passages to Natal are provided; engagements are for three years; candidates must apply to the Agent-General for Natal, 26, Victoria-street, London, S.W., enclosing particulars as to age, height, whether married or single, with medical certificates and testimonials; good platelayers between 25 and 40 years of age, with five years' experience, wages £11 to £15 a month; carriage and waggon examiners, having three years' experience, wages 9s. a day; machine-men, with five years' experience in shaping, planing, and slotting machines, wages 10s. 6d. per day, first year, afterwards 11s. 6d. per day; sawyers, or machine-men, between 24 and 35 years of age, to be able to work circular band, or long saw, wages 11s. 6d., rising to 12s. 6d. per day; holders-up accustomed to locomotive boiler work, wages 9s. per day, rising to 10s. per day after 12 months' satisfactory service; fitters and erectors, turners, copper-smiths, brass-finishers, coach-makers, and wood machinemens able to do general joiner work, wages 12s., rising to 13s. per day after 12 months' satisfactory service; wood waggon builders, 11s. 6d., rising to 12s. per day; sheet-iron workers, 11s., rising to 12s. per day; saw doctors to braize hammer saws and cut teeth, 12s. 6d. per day; signalmen having one year's experience, wages £10 per month, must be under 30 years of age and over 5 feet 7 inches in height, cost of passage outwards will be advanced to signalmen to be repaid by monthly deductions. (**Transvaal.**)—No one can land in South Africa without a permit (see Cape Colony above), and none but refugees, Government employees, and persons engaged in a service of a public nature, will be permitted to move up into the Transvaal. There is a good demand for mechanics, especially those in the building trades; wages are high, carpenters receiving 20s. to 22s. 6d. a day, but the cost of rent and food is at least twice as much as in England.

South African Constabulary.—Candidates for the South African Constabulary in the Transvaal and Orange River Colony should apply to the S.A.C. Recruiting Officer, King's-court, Broadway, Westminster, S.W. They must be good riders, good shots, single, strictly sober, and from 20 to 35 years of age; they will be given free passages to South Africa.

EMIGRATION AND IMMIGRATION.

**** The Imperial Institute acts in concert with the Emigrants' Information Office (which is under the direction of the Colonial Office), of 31, Broadway, Westminster, S.W.; and also with the British Women's Emigration Association, now temporarily carrying on its work in rooms at the Institute. The Handbooks and Quarterly Circulars issued by the Emigrants' Information Office may be obtained at the Commercial Intelligence Office. Special information and practical advice respecting Canada and Cape Colony will also be furnished by the Curators of these Sections.**

UNITED KINGDOM.

British Women's Emigration Association.—The hon. secretary reports that 846 applications have been received in the month ended June 21; 51 have sailed to Canada, 84 to South Africa, 4 to New Zealand, 2 to Australia, 6 to New York, and 1 to Port Said. The proclamation of peace in the great South African Continent, is a matter for thankfulness and rejoicing throughout the whole Empire. "That peace may be established on a firm and righteous foundation" has been, and still should be, the prayer of the nation, and we may trust that prosperity will follow under a just and beneficent rule. A great immigration is to be expected, and preparation for this has already begun, both there and here. Houses have to be rebuilt and businesses re-established. It would be no advantage to the country, or to women proceeding there, for them to arrive in large numbers, until they can at once find shelter and employment. Food is still dear, and lodging still dearer, and women would find themselves worse off than at home, if they were out of work. Yet the presence and influence of loyal, earnest and adaptable women is necessary in the interests of the extended sphere now committed to the trust of the British Empire.

Men have conquered the territory, and women must help to hold it. If the blessings of Christian love are to unite and elevate and purify the people of the various races dwelling there, it is all-important that the lives of the resident British women should embody and demonstrate the domestic virtues and the religion which has been the strength of our nation—the obedience to the law of God, the sense of duty and fair play, the self-sacrifice, the honest independence, the love of home—and "Home is what the Woman makes it."

There are more applicants for passages to South Africa from all classes, than can be accepted at present. The best steps now, would be for employers in South Africa to send home particulars of vacancies for female employees in houses of business, as typists, shop assistants, dressmakers, etc., to the hon. secretary of the South African Committee at this office. Care would be taken to recommend the most suitable persons, from among those who have been accepted as eligible. The contracts would be drawn up according to the terms agreed upon, the employer paying or advancing the passage money. The colonists must look beyond their personal desire for white domestic servants; South Africa needs more than these could supply: it is by the better educated classes, that a wise rule over the native races will be established, and the arts of civilization be valued.

But these pioneers must be capable, practical useful women, with a knowledge of household matters, ready "to do the next thing" and "to make something better."

The dates of sailings for the next parties of women, arranged by the British Women's Emigration Association are, July 17 and August 21 for Canada, July 19 and 31 for South Africa, and August 1 for Australia.

The arrangements should be completed in each case a fortnight before; details as to accommodation, etc. to be had from the hon. secretary, British Women's Emigration Association, Imperial Institute.

COLONIES.

Nova Scotia.—COST OF LIVING.—Some question having been raised by intending settlers in Nova Scotia as to the correctness of the statement made in the Canada Circular of April, 1902, that in Cape Breton the ordinary rate of rent for a small house of three or five rooms is 50s. to £6 per month, Mr. Howard, the Agent-General for Nova Scotia in London, has forwarded for general information the following extract from a letter received from Mr. C. Shields, 2nd vice-president and general manager of the Dominion Coal Company, Limited,

Journal on the subject of the forfeiture of spirits imported from Canada into the United States in certain receptacles, it is notified in a recent Circular of the United States Treasury Department that spirits *in transit* through Canada are not to be considered as *imported* therefrom, for the purposes of the forfeiture clause of para. 290 of the Tariff.

TRANSPORT AND FREIGHTS.

The Freight Market.—Outward coal rates are rather weaker, and last fixtures have been on basis of 6s. Genoa, 6s. 3d. Venice, 5s. 6d. Port Said, 6s. 6d. Las Palmas, 16s. South Africa, 19s. River Plate, 12s. 6d. Rio. **America** continues quiet. **Australia** extremely dull. Rain is badly wanted, especially in Queensland. Steamers fixed 21s. 3d. ore, Port Pirie-U.K. Cont.; 7s. 3d. coals, Newcastle-Java. **Black Sea** shows a slight improvement for backward loading, owing to the prospects of a good harvest. **Eastern** markets quiet. Current quotations are 12s. Bombay, 19s. Rangoon, 21s. 6d. Java. **Mediterranean** markets remain unchanged. **River Plate** steady at 13s., 13s. 6d. up river loading.—WEDDEL, TURNER & Co., June 30, 1902.

UNITED KINGDOM.

Port of London.—The Royal Commission which was appointed two years ago to investigate the causes of the unsatisfactory condition of the trade of the Thames, and to suggest remedies, has now completed its report, and from an ample digest of the document published in the *Shipping Gazette* we quote the following summary of the broad and comprehensive projects of reform proposed as remedy of the obsolete state of the port and its administration:—

1. A single dock authority for London to be created.
2. Thames Conservancy to be abolished, so far as its powers from Teddington Lock seawards are concerned. These to be vested in the new authority.
3. Pilotage, lighting, and buoying of the Thames to be transferred from Trinity House to the new authority.
4. The Watermen's Company to be abolished and its powers absorbed, except as regards charities.
5. Corporation of London to remain the port sanitary authority.
6. The new authority to acquire the docks, warehouses, and other property of the dock companies.
7. The warehouses eventually to be sold or leased.
8. The new authority to create a Port stock, bearing a guaranteed rate of interest, and to issue the same to the dock shareholders, in such amounts as may be determined by arrangement or arbitration.
9. An expenditure within a period of ten years of £2,500,000 on the improvement of the river, and £4,500,000 on docks. To meet this outlay an additional annual income of £250,000 will eventually be required.
10. It is assumed that, after allowing for the economy due to centralisation and for the increase of trade, the ordinary revenue will meet current expenditure and the interest on the Port stock.
11. Purchase of docks and improvement of river to be separately treated, but to proceed concurrently.
12. London County Council and Corporation of London—one or both—should provide capital sums necessary for river improvement.
13. The same bodies—one or both—should guarantee interest on the Port stock.
14. No increase in dock tonnage rates proposed. A uniform charge of 1s. recommended in all the docks.
15. A licensing fee on barges suggested.
16. Additional revenue to be raised by dues on goods landed, as at Liverpool. It is not contemplated that such dues shall be levied on all classes of merchandise, and the expediency of a consolidated rate is suggested.
17. The new authority "will be at liberty" to take steps to abolish compulsory pilotage in the Thames.
18. Forty nominated and elected members to constitute the new authority, whose composition will largely depend on the acceptance of financial responsibility by the London County Council and the City Corporation respectively.

The final paragraph of the commissioners' report sums up the situation as follows:—

In conclusion, we desire to say that our enquiry into the conditions of the Port of London has convinced us of its splendid natural advantages. Among these are the geographical position of the port; the magnitude, wealth, and energy of the population behind it; the fine approach from the sea; the river tides, strong enough to transport traffic easily to all parts, yet not so violent as to make navigation difficult; land along the shores of a character suitable for dock construction and all commercial purposes. In addition to these advantages, London possesses docks which, although they are not in some cases upon the level of modern requirements, are yet capacious and capable of further development. The deficiencies of London as a port, to which our attention has been called, are not due to any physical circumstances, but to causes which may easily be removed by a better organisation of administrative and financial powers. The great increase in the size and draught of ocean-going ships has made extensive works necessary both in the river and docks, but the dispersion of powers among several authorities and companies has prevented any systematic execution of adequate improvements. Hence the port has, for a time, failed to keep pace with the developments of modern population and commerce, and has shown signs of losing that position relatively to other ports which it has held for so long. We are of opinion, however, that if energy and courage be shown, there is no reason to fear that the welfare of the Port of London will be permanently impaired.

Southampton.—At a recent meeting of the Harbour Board the desirability of deepening the channel of Southampton Water, so as to accommodate the largest vessels afloat, was under discussion. It is estimated that the proposed dredging operations will involve an expenditure of £75,000. The question was referred to a committee, who have reported that every effort should be made to meet the requirements of the new shipping combine.

COLONIES.

Cyprus Mail Service.—A contract for a weekly mail service has been entered into between the Cyprus Government and Bell's Asia Minor Steamship Company. Universal satisfaction is expressed by the inhabitants at the establishment of the new service, which began on June 17.

New South Wales Railways.—The Railway Commissioners of New South Wales have presented their report to the Government for the quarter ended March 31 last. The mileage open, as compared with the corresponding period of the previous year, showed an increase of 177 miles, and on the date of the report nearly 3,000 miles were in operation. The earnings for the quarter in question were heavy, amounting to £933,000, but the March quarter is one of the heaviest of the year, as in the months of January, February and March, in opposition to

the northern hemisphere, the grain is being brought in, and the general business is brisk. As compared with the corresponding quarter of the previous year, the earnings showed an increase of £21,000; but, considering the increase in mileage and the natural growth of the country, a bigger total might have been looked for. The country, however, has been suffering from an extremely dry season. The expenditure was rather greater than the increase in the earnings, amounting to £26,000, the percentage of expenditure to earnings going up from 53 to 54½ per cent.

South Africa.—PORT ALFRED HARBOUR.—We have received from the secretary of the Grahamstown and Port Alfred Chamber of Commerce, a copy of the report and plan of the proposed Port Alfred Harbour Works, by Mr. C. W. Methven. It is pointed out that Port Alfred presents remarkable advantages, and the Chamber feels that the great development and commercial prosperity which will set in when the war is over, warrant more ports being opened to meet the necessary requirements of the country in order to secure the trade to colonial ports. The works now proposed by Mr. Methven will open, at a comparatively small cost, a port which is connected by railway with the whole of South Africa, and which should be made available for South African commerce. Alternative schemes are proposed by Mr. Methven, the larger of which includes the dredging of the entrance, and he states that if the entrance is improved in the manner suggested, there can be no uncertainty as to the ultimate results, as it will so greatly resemble the entrance at East London, but with some important improvements over that, that it is safe to assume that what dredging has accomplished there it can accomplish here also. The smaller expenditure would enable the port to develop a coasting trade, and land goods by lighter from large vessels at the outer anchorage, taking the lighters inside for loading or unloading. This would be a considerable advantage over Port Elizabeth, where such operations are liable to serious delay on account of the exposed situation. Port Alfred, however, would not be free from such delays occurring during rough weather, on account of the narrow width of the entrance, which, unless altered as suggested, would always remain a more or less difficult one. If the proposed expenditure of £46,780 under the smaller scheme be incurred, the Government will then have a port costing £296,780 (say £300,000), with a very unsatisfactory entrance, and only capable of carrying on a coasting trade, whereas if the larger sum of say £200,000, necessary for the larger scheme, be incurred, they will have for a total sum of £540,000 a port considerably superior to East London, and capable of far greater development.

FOREIGN COUNTRIES.

Brazil.—An important amalgamation of the three British railway companies in the consular district of Pernambuco and the leasing by the Federal Government of the South of Pernambuco railway, which is an extension of the old Recife and San Francisco railway, has placed the management of these four systems in one hand, that of the Great Western of Brazil Railway Company. The company is now constructing the connecting link between Independencia, in Parahyba, and Nova Cruz, the present terminus of the Natal-Rio Grande do Norte railway, and it is proposed to build a branch line in the State of Parahyba, from the trunk at Itabaina to a town named Campina Grande.

France.—STEAM SERVICE BETWEEN LIVERPOOL AND BAYONNE.—The British Vice-Consul at Bayonne reports that it is observable from the Bayonne Custom-house statistics of imports that practically only a small quantity of general goods arrive from the United Kingdom. This must be attributed to the fact that no line of steamers has yet been started to trade between a port of the United Kingdom and Bayonne. All the British-made goods which are sold in the district are shipped *via* Bordeaux and other French ports, but with the heavy transshipping expenses, forwarding agents' charges and sundry expenses, it is extremely difficult for British manufacturers to compete with German and Belgian manufacturers who can forward goods direct from Antwerp to Bayonne by regular line of steamers between the two ports. The Vice-Consul adds that he has made a special study as to the possibility of running a steamer regularly between, say, Liverpool and Bayonne, and has every reason to believe that a small vessel suited for the trade would prove a success. The quantity of general cargo would at first be limited, but with the large quantities of phosphates which are now imported from Liverpool, a vessel could always fill up spare space with this class of goods. As regards the return voyage resin, resinous oils, turpentine, flour, fruit, cork, wool, timber, etc., would be the principal exports. Toulouse, which is one of the most important French industrial centres, would contribute, as the distance by rail is about the same to Bayonne as to Bordeaux, from which port all the goods are shipped.

German East Africa.—PORT REGULATIONS AT DAR-ES-SALAAM.—The British Vice-Consul at Dar-es-Salaam reports that since 1st December, 1901, all vessels over 100 tons gross, entering and leaving the harbour of Dar-es-Salaam are required to take a pilot on board. This official awaits the vessel in the neighbourhood of Makatumba Island. Vessels over 1,000 tons gross pay 30 rs. (£2) each way. An extra charge of 1 rupee (1s. 4d.) is made for every 100 tons over and above 1,000 tons. In the case of vessels wishing to enter or leave the harbour after dark an additional sum of 50 rs. (£3. 6s. 8d.) will be charged, which includes lighting the buoys. Contravening the above regulations is punishable by a fine of £20, or three months imprisonment. Vessels-of-war of all nations are excepted from the regulations.

Russian Enterprise in the Persian Gulf.—The Odessa correspondent of the *Times* writes:—"In addition to the steamer *Korniloff*, the Russian Steam Navigation Company intend shortly to despatch another of their vessels, the *Truoor*, from Odessa to ports in the Persian Gulf. The officials of the company express themselves fairly satisfied with the results attained by the preliminary voyages of the *Korniloff*, and intend to make a strong bid for return cargo from Bushire, Bandar Abbas, and other Persian ports. With regard to cargo outward bound from Odessa to ports in the Gulf no difficulty is experienced, and the question of attracting passengers to its Persian service is having the Company's serious attention. With the establishment of agencies in all the leading ports *en route* to Bushire, the Russian Steam Navigation Company hopes before next year to be in a position to increase considerably the number of sailings from Odessa, possibly despatching one every six weeks."

The Isthmian Canal.—The United States Senate has relegated to the President the choice of routes for the Isthmian Canal by adopting the Spooner amendment. It provides that the French Panama offer be accepted, if a clear title can be made; if not, the President will proceed under the provisions of the Hepburn Bill, to construct the Nicaragua Canal. The House has already passed the latter with only two dissenting votes. It is believed, however, that the House will concur in the Senate's action. Thus the triumph for Panama is complete.—*Times*.

OFFICIAL AND COMMERCIAL CONTRACTS. UNITED KINGDOM.

Cheltenham.—TENDERS are invited, until the 16th inst. (1) for SUPPLYING and (2) for LAYING ten miles of 12 in. diameter CAST-IRON WATER MAIN between Tewkesbury and Cheltenham. Particulars (£1) may be obtained from Mr. Joseph Hall, Municipal Offices, Cheltenham.

Chester.—The Corporation invite TENDERS, until the 7th inst., for the CONSTRUCTION AND RECONSTRUCTION, AND ELECTRICAL EQUIPMENT OF TRAMWAYS. Particulars (£3. 3s.) may be obtained from J. M. Jones, Esq., City Surveyor, Town Hall, Chester.

Epsom.—TENDERS are invited, until the 9th inst., for the COMPLETION OF THE BACTERIA BEDS, Parish of Cobham, Surrey. Particulars (£5) may be obtained from Messrs. Beesley, Son and Nichols, 11, Victoria-street, Westminster.

Exeter.—TENDERS are invited, until the 14th inst., for the REMOVAL of the existing BRIDGE and the CONSTRUCTION of a NEW STEEL ARCH BRIDGE over the River Exe at Exeter, together with the construction and subsequent removal of a temporary bridge over the River. Particulars (£5. 5s.) may be obtained from Sir John Wolfe Barry and Partners, 21, Delahay-street, Westminster.

Falkirk.—TENDERS are invited, until the 14th inst., for the SUPPLY AND ERECTION of: (4) steam, exhaust, drain, and other pumps, feed-pump, tank, etc.; (5) balancing transformers and motor generators; (6) storage batteries; (7) switchboard and connections; (8) arc lamps, incandescent lamps, and fittings; (9) cable work; (11) travelling crane. Particulars (£2) may be obtained from Messrs. Burstall and Monkhouse, 14, Old Queen-street, Westminster.

London.—The London County Council invite TENDERS, until the 10th inst., for TWO STEEL CABLES, one 30,000 feet and the other 9,400 feet in length. Particulars may be obtained at County Hall, Spring-gardens, S.W.—Tenders are also invited, until the 15th inst., for one ELECTRIC-POWER OVERHEAD TRAVELLING CRANE, to lift 25 tons, and three hand-power overhead travelling CRANES, to lift 10 tons each. Particulars (£2) may be obtained at County Hall, Spring-gardens, S.W.

Southborough.—TENDERS are invited, until the 25th inst., for the CONSTRUCTION of a PUMPING STATION. Particulars (£5. 5s.) may be obtained from Messrs. George and F. W. Hodson, Loughborough.

COLONIES.

South Australia.—TENDERS will be received at the office of the Engineer-in-Chief, Adelaide, South Australia, up till the 30th September, for the CONSTRUCTION of a HARBOUR at Light Passage, Port Adelaide, South Australia. Particulars (£5) may be obtained at the offices of the Engineer-in-Chief, Adelaide, and at the office of the Agent-General for South Australia, 1, Crosby-square, London.

INDIA.

Bombay, Baroda, and Central India Railway.—TENDERS are invited, until the 8th inst., for the SUPPLY of STORES, viz., (1) brass boiler tubes, (2) flanged and plain copper plates, (3) steel material. Particulars (21s.) may be obtained from the Secretary at the Company's offices, Gloucester-house, Bishops-gate-street-without, E.C.

Calcutta.—TENDERS are invited, until the 15th inst., for the SUPPLY AND DELIVERY of 2,800 tons, more or less, of CAST-IRON PIPES and SPECIALS. Particulars (10s.) may be obtained at the office of the Engineer, 33, Norfolk-street, Strand, London.

FOREIGN COUNTRIES.

Norway.—TENDERS are invited, until the 8th inst., by the Army Equipment Depot, for 4,000 metres of blue tunic cloth (*Kjolekloede*), 5,500 metres light material for fatigue jackets (*Vaabenstroer*), 500 metres deep red badge cloth, 500 metres carmine red badge cloth, 8,000 metres blue material for trousers, 8,000 metres twill 3⁹, 8,000 metres twill 3⁷, and 5,000 metres shirts. Particulars may be obtained from the chief manager of the depot.

COMMERCIAL LAW INTELLIGENCE.

"Oceanic's" Lowest Speed.—A decision by the president of the Admiralty Division that in the collision off the Tuskar Light in August last between the leviathan *Oceanic* and the steamer *Kincora* both vessels were to blame, came before the Court of Appeal at the instance of the owners of the *Oceanic*. The case for the appellants was that as the *Oceanic's* engines could not work at less than a speed of five and a-half knots an hour, and as she could stop in about two-thirds of her own length, her speed of six and one-third knots was not excessive in foggy weather. The Master of the Rolls, in dismissing the appeal, said it might be that the *Oceanic* could stop within the distance indicated, but the fact that she did not stop in time to save a collision showed that her speed was excessive.

The Stamp Act and the Bills of Exchange Act.—In the case of BROWN, BROUGH AND CO. v. NATIONAL BANK OF INDIA, LIMITED, it was sought to recover a sum of £391. 2s. 9d., being the amount of a draft drawn by the Madras branch of the defendant bank upon their head office in London. The draft was payable on demand to the order of the plaintiffs in London, and it was remitted by a firm of Taylor and Co., who carried on business in Madras, to the plaintiffs in London in payment for goods supplied. The draft was stolen, and the plaintiffs' endorsement forged on it. In this condition the draft was presented at the defendants' head office, where it was paid. It was admitted that the payment was made in good faith and in the ordinary course of the defendants' business. Mr. Justice Bigham, in giving judgment, said that it was admitted that there was no defence at common law, but two statutory defences were set up. The first was under section 9 of the Stamp Act of 1853. The effect of this section was to protect bankers who paid "drafts or orders" under such circumstances as those in which the draft in question was paid; but the plaintiffs said that the instrument in this case was not a "draft or order" within the meaning of the section, because it was drawn by one branch of a bank upon another. In ordinary commercial language this was a draft or order to pay money; indeed, the plaintiffs in their statement of claim had so described it; and a statute ought to be construed with reference to the common understanding of those whom it affected. It would follow, if this were so, that the section would apply to protect the bank in the present case. The second statutory defence raised was under section 60 of the Bills of Exchange Act (1882). This section was similar to section 19 of the Act of 1853, but in it "bill" was substituted for draft or order. He was not sure that, even in this Act, a "bill" might not be drawn by a person, transacting business in one place, upon himself transacting business in another. Section 5 (ii) pointed to such an instrument being a "bill." His own opinion was that this instrument might be treated as a bill, or, if not as a bill, as a promissory note, and that it would therefore come within the protection of section 60. In his view bankers ought to be protected in the payment of such instruments as these, and, apart from authority, he should be in favour of deciding that both statutory defences were good.

But the question had been determined in the Court of Appeal in the case of "Gordon v. London City and Midland Bank," and he thought that that decision must be taken as applying to all the defences raised. He was, therefore, constrained to give judgment for the plaintiffs.

Insurance.—A decision of some importance has been given in *MILLER v. LAW ACCIDENT INSURANCE SOCIETY, LTD.* The plaintiff shipped a large number of bulls on board the s.s. *Bellevue* for carriage from Liverpool to Buenos Ayres, and insured with the defendants against the usual risks, including arrests, restraints, and detentions of princes and people. The *Bellevue* arrived on September 10, 1900, and the cattle were inspected by the Argentine officials under a decree made a considerable time before the shipment, forbidding the entry of animals suffering from infectious diseases, or coming from countries where such diseases prevailed, with the result that they were rejected. The cattle were then taken to Montevideo, where they were sold at a considerable loss, and the plaintiff thereupon brought an action on the policy. Mr. Justice Bigham gave judgment for the defendants, and said that the right to recover depended whether the loss was directly due to a "restraint of people." In his opinion the loss was not so caused. The mere operation of an ordinary municipal law preventing the delivery of goods was not a "restraint of people" within the meaning of the policy. Those words meant the forcible interference of a State or Government, and did not extend to legal proceedings taking place in the courts of the country.

BRITISH CONSULAR REPORTS.

Germany (Baden).—In the report on the Trade and Agriculture in the Grand Duchy of Baden for the year 1901, H.M. Consul states that the general interruption in the progress of trade and industry in Baden that made its appearance at the beginning of the year 1900, prevailed throughout the whole of 1901. In the spring there seemed some signs of improvement, but the prospect soon became overclouded again, and there was no relief. Commerce was manifestly suffering from the reaction invariably attendant upon a period of prosperity, and with the more severity owing to the previous "boom," having been so very great and prolonged, a period in fact so extraordinary that the turn of the tide upset all calculations, and took almost everybody by surprise. These apparently unavoidable fluctuations, in place of reckless enterprise, enormous energy and activity, boundless aspirations, and absolute faith or credulity, the sudden change to overwhelming depression and apathy, and universal scepticism and suspicion, have as yet found no satisfactory explanation. The causes assigned are on the whole manifestly quite inadequate. Thus, the political events in 1901 were of no great importance. Under normal conditions the disturbances in China and the prolongation of the war in South Africa would hardly have influenced German trade, much less exercised the baleful effects ascribed to them. The invasion of Europe by American iron and steel which caused such sensation and alarm in 1900, dwindled, as regards Germany at least, to quite insignificant dimensions in 1901, and cannot be admitted in explanation. Whatever the cause may have been, for trade and industry 1901 was a bad year. In previous years there had been an immense demand for goods of all kinds and descriptions, to meet which a very large amount of capital had been sunk in the various branches of production. The enquiry, however, had been over-estimated, and the rapidly-swelling production accordingly found itself confronted first by a stationary and then by a diminishing demand. A collapse in prices of most articles followed, and since in the production expensive raw materials and dear coal had been employed, losses were heavy, and this disparity still to a large extent prevails. As a further element of insecurity there was the proposed new Customs tariff, and the doubt as to the possibility of renewing the treaties with other countries. The new tariff submitted by the Government to the Reichstag proved indeed to be of strongly protectionist character, yet failed to satisfy the expectations of the majority, who are comparatively indifferent to commercial treaties, and who assert that German agriculture is being ruined, which, however, is denied by the commercial classes.

Peru (Mollendo).—In a recent Consular report it is stated that the rubber industry still occupies a good deal of attention, and although the quantity shipped this year only exceeds last year's output by 15 tons, this is accounted for by the fact that large quantities are being prepared in the interior ready to ship when the dry weather sets in—from the beginning of April. A few remarks on the difficulties that attend this industry may be of interest. From the time of landing here, about 15 days will be occupied in travelling by train, steamer, mule, and canoe to get to the rubber districts. The first range of the Andes has to be crossed at 17,500 feet above the level of the sea before the descent into the valleys can be effected. Sorata, in Bolivia, is the place at which nearly all the roads into the rubber and mining districts converge. The traveller will often be delayed for several days, as all the owners of beasts of burden take advantage of the scarcity of means of transport, and extort the highest possible freights for their animals. Once work has been started, the cheaper plan is to buy mules and horses. All supplies have to be carried in, as scarcely anything can be purchased there. However, stores are gradually being established on the different claims. The descent is very dangerous in some places, the incline being from 30 to 45 degrees, and the animals often slip and are thrown over the precipices. This part of the road, 23 miles in length, takes 12 hours, when Pararani is reached, 4,600 feet above sea-level. From Pararani to Mapiri the road is more practicable, and rubber, Peruvian bark, and coffee plantations are met. Mapiri is the centre of these regions, and from there one strikes off to wherever the claims may be. At least 90 per cent. of the travellers fall sick with malarial fevers, more or less intense, although seldom fatal. From Mapiri, Guanay is reached in canoes, or rafts, made of nine sticks fastened with vines; three of these rafts form what is called a callopo, capable of carrying 1½ tons of cargo. The distance is 62 miles, and can be done in one day, going down stream, but coming back it takes three days, the current running six miles an hour. The Indians can only pull at the rate of 1½ miles per hour. From Guanay there are roads that lead to the placer mines on the rivers Tipuani, Covahuira, Challana, etc., in which regions gold is found in abundance, but machinery is badly required, especially to dredge the rivers.

Portuguese East Africa (Lourenço Marques).—According to a report just issued from the British Consul-General at Lourenço Marques, Delagoa Bay enjoys the unenviable reputation of being one of the most unhealthy places on the East Coast of Africa. Last year was nearly the worst on record as regards deaths, which were principally due to malaria, hæmoglobinuria, and what is locally called "pernicious fever"; phthisis in a small degree also figures in the official returns. With a view to ameliorate this condition various improvements have been made in the town. Among others in hand the local authorities have commenced filling up the Mahe Swamp, which extends for a considerable distance at the west end of the town, and penetrates into a portion of the inhabited part. This work has on various occasions been started, but it is only within the last few months that any useful work has been done. It is

calculated that about 600,000 cubic metres of earth will have to be brought about three miles and dumped on the swamp. The month. It is expected that after this work is finished the health of the town will be greatly improved. The macadamising of the various roads is proceeding, though slowly. Owing to the topography of Lourenço Marques, much difficulty is experienced with regard to drainage, and the municipality are now studying the question, and intend to improve the actual system prior to instituting a new one. The municipality are also discussing the advisability of constructing a refuse destructor. Up to the present the refuse is removed from the town, and then burnt, but this system is unsatisfactory, and in a climate such as this is not conducive to health.

United States (Charleston).—The British Consul at Charleston, whose district embraces Carolina, Georgia, and Tennessee, says that it has been proved that a number of teas from different countries—Japan, China, Siam, and Formosa—can be grown with profit in South Carolina. Future experiments will probably continue along this line with a view of getting the greatest productiveness from the tea plant in the shortest time. An important point ascertained is that the tea bush can survive very cold weather. While it is undoubtedly better that it should be grown when the mercury does not go below 25 degrees Fahrenheit, yet in the frost of two winters ago the tea gardens were subjected to a temperature below zero, and suffered little injury therefrom. In the East, where tea grows naturally, the rainfall is from two to three times as much as in Carolina during the summer, which deficiency has been compensated for in the Carolina gardens by a system of irrigation. The careful labour needed in picking the delicate leaf has been provided by giving special school advantages to all the little negroes living in the vicinity who are willing to avail themselves of them, and these children are, during school hours, instructed in tea-picking, and during the tea gathering season they are given remunerative work. Experimenting in tea culture was begun at the Pinehurst gardens in 1891. From reports relative to this, the only tea farm in America, it appears that the most important result has been the distinction arrived at as to what will probably be the most profitable tea to cultivate in the country. The most common objection that has been raised to the establishment of an American tea industry has been the difference in the price of labour there and in the East, but, with a full appreciation of its force as applied to poorer grades, there seems to exist, says the Consul, a good profit in the production of those higher grades in whose cultivation cheap labour plays a minor part. The American tea has also this further advantage, that the final drying of the leaf need not be carried to the same degree of heat whereby a sacrifice of much that is agreeable and beneficial in the flavour is entailed. The introduction of modern tea-making machinery, principally invented at Pinehurst, has improved the drinking qualities of South Carolina-grown black tea, and rendered entirely unnecessary the disgust so often expressed by Eastern travellers at the unstinted blending of human perspiration in the laborious manipulation of the tea in over-heated factories.

FOREIGN CONSULAR REPORTS.

Automobiles in Syria and Palestine.—The United States Consul at Beirut reports that enquiries about automobiles are being made in Syria. Only one specimen, an inferior second-hand French machine, has been seen there; but it is thought that in Syria and Palestine, with their lack of railroads and street cars and their rapidly developing carriage road systems, automobiles would do well. A new road is now being built between Sidon and Beirut, and will soon replace the ancient bridle path. While this road will be level, others throughout this region are steep and make numerous sharp turns. Vehicles in use, therefore, must be strong and durable. Between Haifa and Nazareth, the most satisfactory carriages employed in the tourist traffic are powerful, two-seated surreys made in Buffalo, N.Y. In these parts horses suffer greatly from the heat; this difficulty would not apply to a machine. In Beirut alone, 500 carriages are running, and hundreds more are in use in the Lebanon and in Palestine. The country is poor, and except possibly for the accommodation of tourists, there would not at present be much demand for automobiles outside of Beirut. The tourist has more than doubled in Syria during the last ten years. At present, about 750 foreign tourists pass through Beirut annually, most of them proceeding to Baalbek and Damascus. Twice this number go through Palestine. Galilee is also growing in favour among tourists. The figures given do not include pilgrims, thousands of whom seek the holy places, nor the special excursions which lately have come into vogue. Recently the *Celtic* was here with 820 American tourists, while the *Augusta Victoria* brought some 400. Among local physicians there is a growing sentiment in favour of the automobile.

Diamond Fields of British Guiana.—The United States Consul at Demerara reports the outlook of the new diamond industry as very favourable. Ten men, at work for New York parties who located claims up the Mazaruni river a few months ago, recently collected in six weeks 8,227 small diamonds, weighing about 767 carats. The stones were valued at \$9,600 and were shipped to New York. Nearly every expedition that has gone up to the fields has found diamonds. It is not surprising, therefore, that local excitement is intense and that the discoveries have attracted the attention of the diamond interests of Europe and America. The route from Georgetown is up the coast 20 miles and then by steamer to Bartica, 50 miles up the Essequibo river. From there to San-San-Kopai landing, about 1½ miles above Putareng creek, on the left bank of the Mazaruni, the route is covered in small boats in the average time of fourteen days. The navigation of the river is difficult and dangerous, on account of the cataracts and rapids, and skilful boatmen are necessary. The principal diggings now being worked are 5 miles back from the river, and all provisions and supplies are carried there on the heads of labourers. Over 1,200 of these labourers registered at the local department of mines this month and left for Bartica. Many of this number are doubtless destined for the placer gold-diggings of the Cuyuni and Puruni. There are about a dozen companies now in the diamond district, and new expeditions are being fitted out almost daily. Capital and mining experience will be needed to intelligently develop these fields and to provide adequate and safe communication with the seaboard. Manufacturers of structural material should closely observe conditions here, with a view to supplying the machinery and electrical equipments which will be required. For anyone having capital and inclination to invest in a British colony now is a favourable time to consider the inviting features presented in the construction and operation of an electric or steam railway up the Mazaruni river to the heart of the mining district. Such an enterprise would be received locally with great favour. It has been discussed for a long time in connection with the development of the gold-fields and it is generally understood that, in view of the exceedingly small margin of profit in the sugar industry of the colony and its gloomy prospects for the future, steps should at once be taken to facilitate access to the interior.

German Trade Methods in Chile.—The United States Consul writes from Antofagasta on March 9, 1902, in regard to German methods of securing trade in Peru, Chile and Bolivia, as follows:—"Thirty years ago, the trade coming to the Pacific

ports was monopolised by the British and a few American houses. The Germans were represented only by jobbers and shopkeepers in the coast towns. The Germans, anticipating the importance of this trade, made well-conceived plans to gain it. They carefully trained a number of able young men. When these were versed in commercial affairs and in the language of the people among whom they were to live, considerable shipments of goods were made to the British and American houses, and the young men found places as clerks, and were given special charge of these consignments. They remained there till they acquired a complete knowledge of the coast trade; then they were provided with ample funds and stocks, and opened German houses, with brilliant success. In many branches they now have a monopoly, and the British and American houses no longer attempt competition. The Germans not only established houses in the larger ports, but also agencies in the smaller ports and interior towns. Antofagasta is the port of entry and shipment for a large section of Bolivia. In former years the trade of Bolivia was controlled by the wealthy British houses in Taena, which had agencies in Bolivia. The American houses in Valparaiso also had a good deal of business in bark, etc. To-day, the Germans have it nearly all in their own hands. In the south of Chile German banks not only do most of the German business, but a good share of the local trade. The fine steamers of the Kosmos Company have extended their service to Central America and San Francisco. From this last port they fetch barley, flour, etc., and even lumber of certain qualities, to ports as far south as Callao and Iquique. We must follow German methods in foreign trade. Consuls, in their own special sphere, have done much, but United States exporters must not rely too much on official representatives in extending commerce. The Germans have made progress, not through their Consular service, but through private enterprise. The occasional visits of commercial travellers can do some good, but can never develop important trade.

Petroleum Springs of Central Asia.—According to a report by the French Consul-General at Moscow, published in the *Moniteur Officiel du Commerce*, the petroleum springs of the district of Ferghane have for some time attracted the attention of traders and financiers. The whole of this district is said to be rich in beds of naphtha that cause gaseous discharges more or less strong. The mineral oil is generally accompanied by a black bituminous mass which is suitable for the production of asphalt, and, moreover, has already been used to an extent by no means unimportant. The richest deposits are found chiefly in the district of Andiehan, along the River Malu-Son, as well as in that of Marguelan (the deposits of Tchimine). The former have been worked since last summer. The Tchimine deposits situated about 27 kiloms. (16½ miles) from the town of Marguelan, and 20 kiloms. (12 miles) from Wannovskaia, a station on the Central Asian railway, appear to have been worked at a very early period, for the remains of a well may be seen there to which the natives attribute a Chinese origin. Shortly after the occupation of the district of Ferghane, some wells of 20 to 25 metres (65 to 82 feet) in depth, and 1½ metres (5 feet) wide were sunk, and produced an average of 1,600 kilogs. (3,520 lb.) of mineral oil per day per well. This oil, after being submitted to a very primitive distillation, was employed for lighting the town of Marguelan, and for domestic uses. The absence of means of transport and the need of capital caused the working to cease, and about 1880, the springs, so to speak, fell into oblivion. But since 1898, the construction of a railway from Samarkand to Andiehan brought new life to these wild regions. Some engineers became interested in this question, and their efforts were crowned with results so favourable, that they resolved to try afresh the extraction by mechanical means. A society with a capital of 250,000 roubles (about £26,000) was soon formed; apparatus and machinery were bought, labourers' dwellings were built, and since April, 1901, the works have been proceeding successfully. A special pipe is also in course of construction to connect the naphtha springs with the station of Wannovskaia, where it is proposed to build large depôts. The products, it is said, will find a sure and important market in the Central Asian railway, and the line from Orenburg to Fachkente (in course of construction), both of which will consume great quantities as fuel.

Window Glass in Japan.—The United States Minister at Tokio, in a recent report, states that after some discussion in the Japanese Diet in regard to the promotion of window-glass manufacture in Japan, the Government has decided to establish at the industrial experiment station a model factory, or technical school, for training workers in window-glass manufacture. Japan affords the necessary materials for this industry and the cheap labour, but lacks the skilled artisans necessary to make it a success. All of the window-glass now used in Japan is imported, and the market is an increasing one, since it is used for buildings of both foreign and Japanese style. The importation of window-glass in 1899 was valued at 1,250,000 yen (£127,000). Belgium furnishes the greater part of this import. It is estimated that a box of glass which now costs, imported, 7 to 10 yen (1s. 2d. to £1. 0s. 3d.) would, if made in Japan, cost about 5½ yen (11s. 2d.). It is expected that the factory, for which money will probably be appropriated at the next session of the Diet, will be working in a year, and in the course of two or three years will be able to supply enough skilled Japanese artisans to carry on the work in private factories. In the meantime, one or two Japanese have been sent to Germany to study the art; but it is probable that foreigners will be employed to teach methods, assist in the selection of machines, and in other arrangements for the plant.

CHAMBERS OF COMMERCE REPORTS.

UNITED KINGDOM.

London.—The 20th annual general meeting of this Chamber was held on the 10th ult., when, Lord Brassey (president), who occupied the chair, in speaking of the efforts of the Chamber to improve the administration of the Port of London, observed that capital had been wastefully applied in the construction of docks, some of which were badly situated and imperfectly equipped. The interests of the dock companies and the wharfingers were conflicting; the working of lighters by men belonging to a close corporation was an antiquated system, ill adapted to deal with the vast demands of commerce in the present day. The management of the docks should be concentrated as in Liverpool. It should be entrusted to a board, partly nominated, partly representative, and having ample resources at command for carrying out such improvements as might from time to time be necessary. All concerned were looking forward to the report of the Royal Commission, the publication of which could not be long delayed. Under Sir Albert Rolit and a committee the Chamber had taken commercial education in hand with conspicuous success. It was not going too far to say that their work, begun thirteen years ago, was of national importance.

Having dealt with the work of the Chamber in other directions, he proceeded to speak of the general trade of the United Kingdom. The imports in 1901 were valued at £522,238,986, and the exports of British and Irish produce and manufactures at £280,498,889. Imports increased by 0.2 per work is proceeding at the rate of about 30,000 cubic metres per

cent.; exports showed a decrease of 3·7 per cent., but about four-fifths of the diminished value of our exports was represented by the drop in the price of coal. There were no indications of decline in the general prosperity of the country. That our ancient and noble capital held its own as a financial and commercial centre was shown conclusively by the returns of the Bankers' Clearing-house. The clearances in 1901 amounted to £9,561,169,000, being an increase over the previous year of 6·7 per cent. Certain trades might have been prejudicially affected in 1901; but, on the whole, the commerce of the country had been more active and remunerative than might have been expected in the adverse circumstances caused by the war in South Africa.

Nor was the position otherwise than satisfactory in the four opening months of 1902. Taking a broad view, there was full justification for confidence that, in any competition on even terms, we were well able to hold our own as an industrial people. The British Government had not given to private industry and enterprise that helping hand which had been extended in Germany. Contractors had been subjected unrelentingly to the hard conditions of open competition. The prices paid had too often been unremunerative. In the long run losses to contractors meant loss to the Government. Care had not always been taken to maintain a continuity of orders, and costly machinery provided for Government work had stood idle. A great captain of industry had been better treated at Essen. When we compared results, it could hardly be said that open competition had done more for the public advantage in England than regulated monopoly in Germany. If a big effort were needed, the German Government commanded Krupp's splendid resources and his army of 45,000 workmen, highly trained and skilled. No such concentration of power could be found in any single establishment in the United Kingdom. These remarks applied only to the needs of the State in a time of emergency; for ordinary purposes of trade our workers in iron and steel were second to none.

With regard to the Atlantic shipping combine, he said that, contributing four-fifths of the passengers and a large proportion of the merchandise, it was certain that sooner or later some movement similar to that which Mr. Pierpont Morgan had initiated would be brought about by the people of the United States. Let us not lose our national dignity in unavailing and groundless alarms, but rather calmly and confidently face the new conditions with which we had to deal. Our position as a maritime nation was assured beyond the reach of competition. We had gained our position, and would hold it against all comers, because we built ships more cheaply and, with or without foreign crews, sailed them more cheaply than any rivals. It was only in relation to the special type of ocean greyhound that we had reason to be apprehensive of foreign competition. The *Deutschlands*, *Majestics*, and *Lucanias* were costly to build and more costly to work. It was only in the Atlantic trade, and in the busiest season, that such ships could yield a return to their owners unaided by subsidies. If, in consequence of Mr. Pierpont Morgan's combinations, we had to surrender any considerable portion of the trade hitherto carried under the British flag, some action must be taken.

The representatives of Canada, Australia, New Zealand, and other colonies were about to meet under the presidency of Mr. Chamberlain. Under such a statesman it was not likely that the question of ocean subsidies would be neglected. It was our bounden duty to see to it that the ships which carried His Majesty's mails to all the outlying parts of the Empire were second to the ships of no other country. At the conference to be held at the Colonial Office, the possibility of an Imperial Customs Union would probably be considered. It was a subject which bristled with difficulties, and the solution might, perhaps, be long delayed. We were nearer to the people of the United States than we were a century ago. Our relations with our colonies had never been so greatly valued on both sides as they were to-day.

COLONIES.

Natal (Durban).—At the 46th annual meeting of this Chamber, held on March 13, the chairman, Mr. J. Dick, in moving the adoption of the report, said:—The expansion of trade in 1901 has been unparalleled in the history of the colony, but the presence of the army as a factor influencing trade returns makes it necessary to draw deductions with caution. Exclusive of transports, there were entered inwards 787 British ships of 1,654,000 tonnage, and 138 foreign ships of 171,000 tons. The corresponding figures for 1898 are 420 British ships of 701,000 tons and 270 foreign of 472,000 tons. The comparison is satisfactory from every point of view. We imported goods to the value of £3,000,000 sterling from Britain and the colonies, and to the value of £1,500,000 from other countries. The value of articles which the collector states are imported, but might be produced in the colony, is £1,500,000. Again, we exported nearly £1,500,000 to the Transvaal from open stocks, against £1,000,000 in transit—significant figures. Exports by sea total £2,000,000. The change in the percentages of importations from British colonies as compared with foreign countries—8 and 25 of 1897 becoming 16 and 16 respectively in 1901—are gratifying. We buy from foreign countries what we can get advantageously to ourselves—certainly not as a favour to them—and the temper which would advocate that, in order to punish them because they abuse us, we should refuse to buy from them is hardly the spirit in which to approach so intricate a subject as that of a preferential tariff for British and Colonial goods. The proposal can fortunately, however, be put forward on other grounds. We may elect to face commercial retaliation, to introduce an indeterminate disturbing element into international trade, to use dearer and worse goods than are obtainable in the world's markets, and to tax ourselves, all in order that we may benefit the other members of the Empire and move a step towards the ideal of an Imperial Zollverein; and if we spend blood and treasure for the general good of the Empire, it may be possible to justify the sacrifices which will be entailed by the adoption of a preferential tariff. The question, however, has not been thought out by the colony, and any hasty decision is to be deprecated.

During the year a committee was appointed by the Governor to consider certain correspondence from Mr. Chamberlain regarding measures which may be taken to further British trade. A commercial intelligence branch has been established in London in intimate connection with the Board of Trade; and, among other recommendations, the committee suggested that the Collector of Customs should be appointed as an officer in Natal, through whom communications on all matters pertaining to trade might be carried on between the Bureau and mercantile bodies or merchants in Natal.

The pressure of military demands affects the commerce of the colony at many points, and its results are so far-reaching, through so many different channels and agencies, as to escape recognition in their ultimate operation. The more obvious consequences have been the congestion at the port and on the railways. While we all willingly and gladly acknowledge that military necessities have the first call on the resources of the colony, I think that at the port the consideration which was possible has not been given to the interests of civil trade by the military authorities. Berthage, sheds, and wharf spaces have not, it seem to me, been turned to the best account consistent

with that regard for civilian traffic which was practicable under the circumstances. As a large force will be in the country for a long time to come, it is not unreasonable, I think, to ask that the War Office should establish stores away at the Point instead of using sheds and wharf spaces for warehousing and depositing military supplies.

As steamers have been lying three deep at the wharves, the necessity for more berthage accommodation has become imperative, and attention is being given to the plans of the engineer for the improvement of the inner works. His proposal for a line of wharves parallel to St. Paul's wharf is the subject of criticism, as being likely to cause congestion of railway and trolley traffic at the outlet near the Cold Storage Works, and also as diminishing the available waterway in the bay. A project has been announced for developing the head of the bay by private enterprise, and in the meantime the intention of the Durban Corporation to use their land beyond the Albert Park appears to hang fire. The course adopted of putting before Sir Charles Hartley certain plans for approval or modification, instead of asking for his recommendation in detail for the best utilization of the whole of the bay, has, perhaps, been unfortunate; but, as there seems to be a likelihood of a party warfare on engineering subjects, which can never satisfactorily be solved by politics, I venture to suggest that it is not too late yet to invite Sir Charles to visit the colony again and draw out a scheme to make the best use of all the possibilities inherent in our harbour. The probable growth of the port in the near future can better be realised now than was possible even a year ago, and a review of the whole position by Sir Charles Hartley could not fail to be of value.

The schemes for dealing with the large tonnage expected to arrive at the port are associated with the question of the provision being made for carrying the goods up-country; for, after all, the through traffic to the Transvaal will be the main factor in our trade. The question of the construction of an alternative line, or of the duplication of the present railway, is about to become the most important subject for the decision of the colony. The railways will, we are assured, be in a position by the end of the year to carry a million tons per annum to the Transvaal, that is during 1903, when development in the Transvaal will have, let us assume, begun in earnest. The largest tonnage carried in any one year before the war over the Natal railways to the Transvaal, let me remind you, was under 200,000 tons, and the total tonnage taken into the Transvaal in any year from the Cape ports, Natal, and Delagoa Bay was 601,000 tons. Our railways will, to put it another way, be able to convey in 1903 to the Transvaal about five times as many tons as they actually carried there in any year before the war, and nearly twice as many tons as entered the Transvaal by all the routes. The other railways are not standing still, we may be sure, but are increasing their carrying capacities. Pressure will be brought to bear on us to reduce our transit dues and our charge for collection of Customs duties, and with no less certainty the profits the railways make on the through carrying trade. The lever will be the Delagoa Bay line. We shall then be forced to contemplate the triumph of the line which can be worked with greatest economy. If the main line can be altered at a reasonable outlay to a grade of 1 in 50, and duplicated without being lengthened unduly, the course to be adopted is clear; but, if this improvement is not possible, then an alternative line of 1 in 50, however costly, will alone enable us to compete for the Transvaal trade; and the saving on the haulage of every train, as above illustrated, will in time counterbalance the interest on the cost of construction of the new line. I deprecate a hasty conclusion amidst the heated controversy of party politics on a matter so vital to the existence of the colony, and I would advocate the reference of the question to a Standing Committee of both Houses, which should be appointed to consider all schemes for railway extension, and without whose recommendation no proposal should be entertained by Parliament. Only by some such arrangement will it be possible to prosecute a comprehensive and consistent policy for the development of the country by railways.

The publication of the balance-sheet of the South African Cold Storage Company has been one of the noteworthy events of the year, and has given point to the results of the gradually increasing influences of what are known as Trusts or Rings. Government have elected to be their own insurers of property against fire owing to the rates charged by the Insurance Association, and are boring for coal in the northern districts with the view of becoming independent of the coal companies for supplies to the railway. The Shipping Ring has been the subject of debate in the House of Assembly. Trusts are regarded as evils in our modern commercial life, and the re-establishment of free competition is sought for as the remedy. But we cannot go backwards. A combination to regulate prices is the natural sequence to unrestricted competition. May I suggest that natural forces are urging us towards public control of public interests, and that to look for a remedy in any other direction will be fruitless. The municipalisation of industries widens in its scope; and a Trust, having gathered the various interests of a trade under one control, is, to my mind, a step towards public ownership and management.

GENERAL INTELLIGENCE OF THE PAST MONTH.

June, 1902.

UNITED KINGDOM.

JUNE 1st: The conclusion of Peace was announced. The Queen Victoria Memorial Fund amounted to £196,000. The Mansion House Fund for the relief of the distressed in St. Vincent amounted to £51,000. Death of the Marchioness of Northampton.

2nd: Great rejoicings took place at the termination of the war. The King held an Investiture and Levée at St. James's Palace. The Prince and Princess of Wales held a reception at Marlborough House. The Alien Emigration Commission held a meeting.

3rd: The King was present at the opening of the Epsom Summer Meeting. The Birthday of the Prince of Wales was celebrated. The first annual meeting of the Royal Military Benevolent Fund was held.

4th: The King and Queen, with the Prince and Princess of Wales, visited Epsom. Addresses of Congratulation on the conclusion of the war were received by the King. The Lord Mayor entertained His Majesty's Judges at a banquet at the Mansion House. Death of Sir Richard Cotton.

5th: Death of the Rev. H. Latham, Master of Trinity, Cambridge. In the Houses of Parliament, votes of thanks to the troops in South Africa were passed, and also a grant of £50,000 to Lord Kitchener. Lord Avebury opened Sir John Cass Technical Institute, Aldgate.

6th: The King and Queen held a Court at Buckingham Palace. The annual dinner of the National Union of Conservatives and Constitutional Associations took place. Mr. Chamberlain opened the Colonial Troops Club. The Prince of Wales received H. E. Te-Yi-Chang the Chinese Minister, and H.I.H. Prince Chin, Special Ambassador of the Emperor of China at the Coronation.

7th: The Prince and Princess of Wales witnessed the Lads' Drill Association Display of Physical Training. Death of Lord Braybrooke. Mr. John Morley addressed a Liberal meeting in Edinburgh. The King and Queen and other Members of the Royal Family attended the Thanksgiving Service at St. Paul's for the conclusion of Peace.

9th: Death of Mr. Joseph Brown, K.C. In the House of Lords the Loan Bill was read for a third time.

10th: The Royal Counties Agricultural Show was opened at Reading. The London Chamber of Commerce held their annual meeting. Lord Rosebery presided at a meeting at Queen's Hall to protest against the Education Bill. Princess Christian opened an Exhibition in aid of the French Charities in London.

11th: "Colonel" Lynch, M.P., was remanded at Bow-street on a charge of high treason. The King and Queen accompanied by the Princess Victoria were entertained at dinner by the United States Ambassador. Mr. Chamberlain presided at the annual dinner of the Corona Club. Mr. L. Courtenay presided at the annual meeting of the International Arbitration and Peace Association.

12th: The King and Queen visited Westminster Abbey. The English Church Union held its anniversary meeting. A large deputation of Free Churchmen waited on Mr. Balfour to protest against the Education Bill.

13th: The King received addresses of loyalty and congratulation on the conclusion of Peace. The King and Queen held a Court at Buckingham Palace. The Prince of Wales presided at the annual Civil Service dinner. The Duke of Argyll opened the British Colonial Art Exhibition.

14th: The King and Queen left London for Aldershot. The Prince of Wales reviewed the Boys' Brigade. Mr. Seddon, the Premier of New Zealand, arrived in London. Death of the Rev. J. Spurgeon.

15th: Hospital Sunday. A Church Parade of Colonial troops was held in the Alexandra Palace. Death of Mr. F. W. M. Ravenscroft.

16th: The Queen reviewed the troops at Aldershot. Lord Howe opened a Naval and Military Exhibition at Portsmouth. The King, though suffering from indisposition, was able to travel from Aldershot to Windsor. A reception was given to meet Mr. Seddon, at the Imperial Institute, by the Agent-General for New Zealand.

17th: The King recovered from his indisposition. The Coronation Banquet of the Royal Asiatic Society took place. Mr. Seddon was the principal guest at the Annual New Zealand Banquet.

18th: The Duke of Connaught inspected the Colonial and Indian troops at Aldershot. The Royal Society's second conversation took place. The Victoria League held its annual meeting. Death of Mr. Samuel Butler.

19th: Death of Lord Acton. Mr. P. McHugh, M.P. for North Leitrim, was committed to prison.

20th: The Duke of Connaught laid the foundation stone of the new building of Charing Cross Hospital. The Imperial South African Association held their annual meeting. Mr. G. A. Hiek was elected Master of Trinity Hall, Cambridge.

21st: The King received Lt.-Col. H. I. Hamilton with Peace despatches from Lord Kitchener. The Queen Victoria Memorial Fund amounted to £200,000. Many Coronation guests arrived in London.

23rd: The King and Queen returned to Buckingham Palace from Windsor. The Prince and Princess of Wales returned to York House. Prince Komatsu of Japan was entertained by the Lord Mayor. The Colonial Premiers visited the Potteries. The fourth West Australian dinner took place. The annual meeting of the Navy Records Society was held.

24th: In consequence of the serious illness of the King, the Coronation was postponed. Lord Northbrook and the committee of the Northbrook Society held a reception at the Imperial Institute of the Indian princes and chiefs invited to the Coronation. The United Empire Trade League entertained at luncheon the statesmen of Greater Britain and the Imperial guests attending the Coronation. Mr. Alderman Truscott and Mr. Brooke-Hitching were elected Sheriffs of London for the ensuing year. Death of Mr. H. A. D. Seymour, Deputy-Master of the Mint.

25th: It was announced that the King's condition was satisfactory. The list of Coronation Honours was issued. A new Order of Merit was created by the King. In the House of Commons the Finance Bill was read a third time.

26th: Intercessory services were held in many churches on behalf of the King. Death of Mr. W. Lidderdale, of the Bank of England. The Prince and Princess of Wales entertained 1,300 charity children at Marlborough House. Death of Lord Ellenborough. Death of Major-General Sir Francis Scott.

27th: The Prince and Princess of Wales entertained another party of 1,100 children at Marlborough House. Coronation festivities of a modified kind were held in various provincial towns. Death of Lord Henniker, Governor of the Isle of Man. Death of Major-General John Bates. Death of Dr. Chase, Principal of St. Mary Hall, Oxford.

28th: The King was reported to be out of immediate danger. A conference of Jewish literary societies in London and the provinces was held.

29th: An intercessory service was held at St. Paul's Cathedral on behalf of the King.

30th: The King continued to make steady progress towards convalescence. The Coronation bonfires were lit. The conference of Colonial Premiers was opened at the Colonial Office. The Indian Princes visited Spithead. An International Tramways and Light Railways congress was opened by Mr. G. Balfour.

COLONIES.

Australia.—1st: The news of Peace was received with great rejoicings.—24th: Universal sympathy was manifested concerning the illness of the King. **New South Wales.**—5th: Death of Sir Daniel Cooper in London. The troops, returned from South Africa, were publicly entertained in the Town Hall, Sydney.—14th: The death of the Dean of Sydney was announced.

Victoria.—3rd: In the Legislative Assembly Mr. Irvine's motion of censure on the Ministry was carried by 45 votes to 42.—8th: A new Ministry was formed, Mr. Irvine being Premier and Attorney-General.—17th: The Ministry proposed a reduction of the number of the Assembly to 56, of the Council to 28, and of ministers to 7, without diminution of salaries. **Western Australia.**—24th: Death of Mr. Leake, Premier and Attorney-General. The Ministry resigned.—30th: A new Ministry was formed, with Mr. James as Premier and Attorney-General.

New Zealand.—1st: The news of Peace was celebrated with great rejoicings.—13th: Dr. Cowie, Bishop of Auckland, and Primate of New Zealand, resigned on account of ill-health.

British West Africa.—12th: It was announced that the British expedition under Colonel Morland had reached Lake Tchad.

Canada.—1st: Great rejoicings took place on the news of Peace being received.—3rd: Death of the Roman Catholic Bishop of St. Albert.—4th: A meeting of Boards of Trade was held at Toronto, urging preferential trade within the Empire.—13th: The Legislature of British Columbia passed a resolution

prohibiting the killing of fur seals before the opening of the pelagic season.—24th: Great sympathy was expressed at the news of the King's illness.

Cape Colony.—1st: The news of the conclusion of Peace was received with great satisfaction.—5th: Commandant Fouché and many other Boers surrendered.—7th: A mass meeting was held in Cape Town to support the Imperial policy, and to advocate the suspension of the Constitution.—9th: It was notified that the colonial forces would be subject to the Army Act for three months, as if on active service.—18th: Arrangements were made for the return of the troops to England. 25,000 signatures were attached to a petition for the suspension of the Constitution.—23rd: Lord Kitchener left Cape Town for England.—26th: Another commando surrendered at Beaufort West. Over 15,000 persons in Cape Town and vicinity signed the petition for the suspension of the Constitution.

Malta.—24th: All festivities were postponed on the news of the King's illness being received.

Natal.—1st: News of the conclusion of Peace was announced.—27th: The Canadian and Australian troops sailed from Durban.

Newfoundland.—11th: The French fisheries on the Great Banks proved a complete failure.

Orange River Colony.—23rd: Lord Milner became Governor of the Colony, and Major Goolt-Adams Lieutenant-Governor.

St. Helena.—3rd: The news of Peace was received by the Boer prisoners with great rejoicings.—27th: 478 Boer prisoners left for South Africa.

Transvaal.—1st: The Boer Convention at Vereeniging decided to accept the British terms of Peace.—3rd: Lord Kitchener congratulated the Boers on their decision, and welcomed them as citizens of the British Empire.—7th: Many surrenders of Boers took place.—8th: Thanksgiving services were held for the restoration of Peace.—10th: A law imposing a tax of 10 per cent. on the net produce of the mines was issued.—11th: General Lyttelton left Natal for the Transvaal to take over the chief military command in South Africa. The Boer surrenders numbered 10,225.—14th: Lord Milner arrived in Pretoria.—17th: Lord Kitchener highly complimented the Boer leaders on their courage and energy.—18th: The surrenders numbered 18,400. Lord Kitchener was entertained at a banquet at Johannesburg.—21st: Lord Milner became Governor.

INDIA.

2nd: The number of persons on famine relief increased to 485,000.—6th: The Legislative Council passed the Sugar Duties Bill imposing countervailing duties on German and Austrian sugar.—13th: Mr. G. S. Henderson was appointed a judge of the High Court at Calcutta.—14th: The total on famine relief was 475,000.—25th: The number of persons on famine relief decreased by 16,000.

FOREIGN COUNTRIES.

Abyssinia.—1st: An agreement delimiting the boundary between British Sudan and Abyssinia was concluded.

Argentine Republic.—28th: The Senate approved the ratification of the recent agreements with Chile.

Belgium.—12th: The Second Chamber adjourned after adopting the cable convention with Germany.—23rd: The Count of Flanders resigned his army appointments.—22nd: The population of Belgium, according to the corrected returns of the recent census was stated to be 6,693,000.

Chile.—1st: The details of the agreement with Argentina were published.—21st: The Senate ratified the agreement with Argentina.

China.—6th: The Dowager Empress and the Emperor received the Grand Duke Vladimirovitch at the Palace in Peking.—7th: A proposal for a 5 per cent. duty payable in gold was withdrawn by Shêng.—10th: Arrangements were made for commencing the Canton-Hankau railway.—17th: The strength of the German contingent in China was reduced to 3,300 men.—26th: The Russian evacuation of Manchuria commenced.—28th: Cholera broke out in Peking.

Colombia.—24th: Peace was restored, and a general amnesty proclaimed.

Crete.—11th: Prince George left Suda for London to attend the Coronation.

France.—1st: The new Chamber of Deputies met.—3rd: M. Waldeck Rousseau tendered the resignation of the Ministry, which was accepted.—6th: M. Bourgeois was elected President of the Chamber.—7th: A new Cabinet was formed, with M. Combes as Premier and Minister of the Interior and Public Worship.—11th: The annual general meeting of the Suez Canal Company was held.—12th: A vote of confidence in the Ministry was passed in the Chamber.—14th: A brilliant fête took place at the British Embassy.

German West Africa.—20th: The railway from Swakopmund to Windhoek, 380 kilometres, was opened.

Germany.—7th: The second reading of the Bill for the abolition of the "dictatorship" paragraph in Alsace-Lorraine was carried in the Reichstag.—9th: The Reichstag accepted the Brussels Sugar Convention.—10th: The Sugar Bill was read a second time in the Reichstag.—16th: The Emperor and Empress were present at the jubilee festival of the Germania Museum at Nuremberg.—18th: An International Trade Union Congress was held at Stuttgart.—23rd: Her von Thienen, Prussian Minister of Public Works, resigned, and was succeeded by Major-General Budde.—26th: The Emperor placed King Edward à la suite of the German Navy.—28th: It was announced that the triple alliance between Germany, Austria-Hungary and Italy had been renewed.

Holland.—3rd: The Boer delegates had a conference with Mr. Kruger at Utrecht.—6th: The Second Chamber passed a Bill authorising the subsidy of a monthly service of steamers under the Dutch flag between Java, China, and Japan.

Italy.—6th: The Chamber adopted a Bill sanctioning the construction of an aqueduct from the Apennines throughout the province of Apulia, at a cost of £8,000,000.

Martinique.—6th: Another eruption of Mount Pelée took place.

Mexico.—16th: The death of General Escobedo was announced.

Philippines.—20th: The cost of the war to date was stated to be \$170,326,586.—27th: The House of Representatives, at Washington, passed the Philippines Civil Government Bill. A proclamation of amnesty for all political prisoners, including Aguinaldo, was issued, to take effect from July 1.

Portugal.—Sir M. Gosselin was appointed British Minister at Lisbon.

Spain.—5th: A new five per cent. loan of 338,400,000 pesetas was issued.

Sweden.—28th: The Ministry resigned.

Switzerland. The Museum of War and Peace, founded by the late M. Bloch, was opened at Lucerne.

Tunis.—11th: Death of the Bey Ali,

Turkey.—2nd: The negotiations between the Oriental and Anatolian Railways respecting a through traffic were broken off.—5th: Fuad Pasha was sentenced to imprisonment for life.—28th: Mgr. Firmilian was consecrated as Bishop of Uskub.

United States.—4th: The Hon. M. Herbert was appointed British Ambassador at Washington.—9th: The House of Representatives passed the Anti-Anarchist Bill.—13th: President Roosevelt strongly urged Congress to concede reciprocity to Cuba.—14th: The Shipbuilding Trust purchased the undertaking of the Bethlehem Company.—26th: The House of Representatives adopted Mr. Spooner's Bill for the purchase of the Panama Canal.

Venezuela.—7th: The revolutionists were repulsed in an attack on La Guaira: the French Cable and telegraph wires were cut.

FORTHCOMING EVENTS.

UNITED KINGDOM.

London.—On the 3rd inst. an AUSTRALIAN FESTIVAL will be held at the People's Palace.—On the 5th inst. the KING'S CORONATION DINNER TO THE POOR will take place.—The NATIONAL INDIAN ASSOCIATION will hold a RECEPTION at the Imperial Institute on the 7th. The 7th inst. is fixed for the annual visit of the Lords of the Admiralty to Devonport.—A Banquet to Lord Roberts by graduates of the Irish Universities will be held on the 8th inst. On the same evening the annual dinner of the HARDWICK SOCIETY will be held, the Colonial Representatives being special guests.

FOREIGN COUNTRIES.

Austria-Hungary.—FISHERY EXHIBITION IN VIENNA.—An International Fishery Exhibition is to be held from September 6 to 21 in Prince Schwarzenberg's grounds in Vienna, under the patronage of the Archduke Francis Ferdinand of Austria-Este. The exhibition is intended to give a picture of the development and present conditions of fisheries from the point of view of the trader, the naturalist, and the sportsman. The flora of seas, rivers, and lakes will also be dealt with, and there will be a section devoted to the literature of the subject. Great Britain is represented on the committee by Dr. Fulton. Director of the Royal Fishery Board for Scotland. Intending exhibitors should apply to the British Consul-General in Vienna.

Belgium.—INTERNATIONAL EXHIBITION IN BRUSSELS.—The Brussels Correspondent of the *Times* writes, under date June 17:—"A movement is on foot for holding an International Exhibition in Brussels in 1907. Although due to private enterprise, the undertaking would receive Government support as on the occasion of the last exhibition in 1897, and is projected on a far more extensive scale. The date has been fixed so as to allow an interval of a decade to elapse since the last World's Fair in Brussels; and it will also afford sufficient time for completing the new chain of outer-circle boulevards and other improvements now in progress."

NAVAL AND MILITARY INTELLIGENCE.

NAVAL.

The *Astræa*, cruiser, Captain C. J. Baker, was paid out of commission at Chatham on the 12th ult.

Rear-Admiral W. H. Henderson has been appointed Admiral Superintendent of Devonport Dockyard, to date July 1.

The *Medusa*, cruiser, refitting at Jarrow-on-Tyne, is to be placed at the disposal of the special boiler committee for experimental purposes.

The *Doris*, cruiser, was commissioned at Devonport on the 4th ult., by the ship's company of the *Arrogant*, cruiser, paid off on the previous day.

The *Dryad*, torpedo-gunboat, Lieut.-Commander C. P. R. Cooke, has been lent from the Mediterranean to the East Indies Squadron for special service in the Gulf of Aden.

The Admiralty has contracted for the new sloop, *Clio*, now being built at Sheerness, to be fitted with Niclausse water-tube boilers.

Rear-Admiral the Hon. A. G. Curzon-Howe, C.B., hoisted his flag on the 5th ult. in the *Cambridge*, gunnery ship, at Devonport, as second in command of the Channel Squadron.

The *Dreadnought*, battleship, is to be fitted at Chatham, for service as tender to the *Defiance*, torpedo school ship at Devonport. It is estimated that the work will cost £5,000.

Another submarine, the fifth built for the Navy by Messrs. Vickers, Sons, and Maxim, was launched on the 10th ult. at Barrow. A specially large submarine, 100 ft. long, is now on the stocks.

The *Ariadne*, cruiser, was commissioned at Portsmouth on the 5th ult., by Captain M. E. Browning, as flagship of Vice-Admiral A. L. Douglas, the new Commander-in-Chief on the North America and West Indies Station.

The *Retribution*, cruiser, was commissioned at Devonport on the 5th ult., by Captain H. Lyon to relieve the *Psyche*, cruiser, Commander E. M. C. Cooper-Key, on the North America and West Indies Station.

The *Panthe*, sloop, was commissioned at Sheerness Dockyard on the 5th ult., by Commander Hugh T. Hibbert, with a complement of 113 officers and men for service on the North America and West Indies Station.

The Admiralty has given instructions for the 6-in. and 4.7-in. gun mountings to be removed from the *Dido* and *Isis* at Chatham. Some of them are to be appropriated to the *Furious*, and the remainder will be sent to Portsmouth.

Captain the Hon. Hedworth Lambton, C.B., Aide-de-Camp to His Majesty and Commander-in-Chief of the Royal yacht, is to retain the command of the *Victoria and Albert* after his promotion to the rank of Rear-Admiral.

The twin-screw cruisers *Isis* and *Dido*, which have recently returned from abroad, are again to be brought forward for service. Both of these vessels were commissioned at Chatham on May 10, 1898, for the Mediterranean Station.

The new cruiser *Cornwall*, at Pembroke Dock, is to be launched on October 29. She is of the *Monmouth* class, with a displacement of 9,300 tons. Her engines will be built by Messrs. Hawthorne, Leslie & Co., Newcastle-on-Tyne.

Major-General William Purvis Wright, R.M.L.I., has been appointed Deputy-Adjutant-General of Royal Marines at the Admiralty, in succession to Major-General John I. Morris, R.M.L.I., from the 19th inst.

Admiral Sir John Fisher has been read in at the Admiralty as Second Sea Lord, and entered upon his duties on the 11th ult., in succession to Vice-Admiral A. L. Douglas, appointed Commander-in-Chief on the North America and the West Indies Station.

The *Scylla*, cruiser, was commissioned by Captain S. V. Y. de Horsey at Chatham on the 5th ult., with a care and maintenance party, to convey a new crew to the *Tribune*, cruiser,

Captain A. A. C. Galloway, which is recommissioning for further service on the North America and West Indies Station.

The new second-class cruiser *Encounter* was launched on the 18th ult. This vessel, which is one of two cruisers provided for out of the naval estimates for 1900-01, is an improvement on the *Highflyer* class of second-class cruisers, of which there are three—i.e., the "*Highflyer*," "*Hermes*," and "*Hyacinth*."

The new first-class armoured cruiser *King Alfred* arrived at Portsmouth from Barrow-in-Furness, where she was built, on the 10th ult., and was at once taken into the dockyard basin to prepare for her steam trials. An average speed of 18 knots was made during the passage from Barrow to Portsmouth, although at times she worked up to 20 knots.

The *Exmouth*, battleship, returned to Plymouth on the 16th ult. after a 30 hours' trial at four-fifths power. The results were:—speed, 18 knots; vacuum, 27.6 starboard, 27 port; revolutions per minute, 113.2 starboard, 112.8 port; i.h.p., 6,934 starboard, 6,840 port—total, 13,774; coal consumption per i.h.p. per hour, 1.95 lb. The engines worked smoothly throughout.

The new Bermuda floating dock, which has been thoroughly examined since the battleship *Sans Pareil* was successfully docked in the structure, left Sheerness on the 16th ult., in tow, for the West Indies. The dock carried 600 tons of coal as a reserve supply for the Dutch tugs which have been chartered to take her to Bermuda. The dock is 54.5 ft. long, and the walls are 53 ft. 3 ins. high. It is capable of lifting a vessel of 17,500 tons in weight and drawing 32 ft. of water.

The *Bedford*, cruiser, returned to Plymouth on the completion of two 30-hour steam trials off the Cornish coast. The mean results of the first trial with the engines working at low pressure, were as follows:—Steam at engines, 238 lb.; in boilers, 255 lb.; vacuum—starboard 26.8 in., port 26.3 in.; revolutions—starboard 85, port 84; indicated horse-power—starboard 2,250, port 2,272—total, 4,522; speed, 14.92 knots; coal consumption, 1.97 lb. per i.h.p. per hour of the second trial. The mean results of the second trial were:—Steam in boilers, 246 lb.; at engines, 222 lb.; vacuum—starboard, 25.6 in.; port 27.1 in.; indicated horse-power—starboard, 7,952, port 8,053—total, 16,005; air pressure .26 of an inch; speed, 21.2 knots; coal consumption, 1.97 lb. per indicated horse-power per hour.

The Admiralty has issued an abstract of returns of the prize firing from heavy guns in the Royal Navy during 1901. Once again the *Terrible* comes out at the top of the list, and the gunners of this mighty cruiser last year broke all previous records. From twelve of her 6-in. guns 128 rounds were fired, and no fewer than 102 hits were scored, thus giving a percentage of 79.68 hits to rounds fired. The *Terrible* fired her rounds at the rate of 5.33 per minute, a faster rate than any other vessel that took part in the competition. With her 6-in. guns the *Terrible* made 4.25 hits each minute. With her 9.2-in. guns she made fourteen hits in twenty-two minutes, giving a percentage of 63.63 hits to rounds fired, or 1.16 hits each minute. Next to the *Terrible* comes the *Barfleur*, also on the China Station. She fired 159 rounds from her 4.7-in. guns, and made 114 hits, giving percentage of 71.7 hits to rounds fired.

France.—The names of the four battleships whose construction is to be commenced during the present year for the French navy are:—*Democratic*, *Liberté*, *Justice*, and *Vérité*. One of these is to be built in the Government dockyard at Brest, and the others by private contract. In addition to these, two large armoured cruisers, to be named the *Jules Michelet* and *Ernest Renan*, are to be laid down, the one at L'Orient and the other by a private firm. Of smaller vessels the French Government have authorised the construction this year of thirteen submarines, two destroyers, and sixteen torpedo-boats, the greater number of which are to be built by contract.

Germany.—Judging by the present state of the work of constructing the new German battleships of the *Wittelsbach* class, the *Zähringen*, now being built in the Germania Yard, will be the first vessel of the new type to be completed next October, when it will undergo its trial trips, and it will be the only new battleship to be taken over for service by the Admiralty during 1902. The *Wittelsbach*, which was launched nearly twelve months before the *Zähringen*, will probably not be ready before early next year. The *Wittelsbach* is to be the Squadron flagship, and accommodation is now being provided on it for the Squadron staff, which will number 65 officers. The first battleship of the improved "H" class was launched on the 13th ult., from the Germania Yard.

Italy.—In the Naval Estimates for the coming financial year there is a slight increase in the allowance for ship-building. For the next five years some 29,000,000 lire (£1,160,000) per annum will be spent under this head, an increase of 1,169,000 lire as compared with the past year. Of the 29,000,000 lire nearly 13,000,000 will be devoted to fitting out the battleships *Benedetto Brin* and *Regina Margherita* and the second-class cruiser *Francesco Ferruccio*, recently launched at Naples, Spezia, and Venice. A sum of 10,000,000 lire will be absorbed by the first-class battleships *Vittorio Emanuele* and *Regina Elena*, now building at Naples and at Spezia, while 1,700,000 lire are assigned to cover the cost of placing three new battleships of the same type on the stocks at Castellamare, Spezia, and Venice. The smaller items include a credit of 800,000 lire for a submarine boat, a branch of naval enterprise in which Italy has remained behindhand for want of funds, although the old submarine *Delfino*, at Spezia, testifies to the fact that she was one of its pioneers. The Minister of Marines has decided to dispose of sixteen men-of-war, which are considered obsolete, and unfit for foreign service. They will be struck off the active list, and replaced by the vessels in course of construction. A new type of submarine is to be tested, and should it prove satisfactory eight of these vessels will be built.

Russia.—The *Kronstadt* *Viesnik* states that the "Zakladka," or formal ceremony of laying a plate, of the two new Russian cruisers *Izumrud* and *Jemchug*, building at the Nevski Shipbuilding and Engineering Works, St. Petersburg, took place on June 14. The length of each cruiser will be 347 ft. 10 in.; beam, 40 ft.; draught with full load, 16 ft.; displacement, 3,100 tons; number of boilers, 16 of the Jarrow type; engines, 17,000 h.p.; speed, 24 knots.

United States.—The experiments now proceeding with oil fuel for the United States Navy have been so successful that Rear-Admiral Melville, who is supervising the tests, predicts that the Navy will abandon coal in favour of oil before his term of office has expired. His engineers have produced one-third more steam from standardised boiler oil than from the best coal. The chief difficulty in using oil is the forced draught existing in the fire boxes, which will not stand intense heat, but the experts are sanguine of circumventing this. Another drawback is the deafening noise of combustion. This is probably irremediable, but it is claimed that it would not signify in battle conditions, while ordinarily there is a natural draught which is not excessively noisy. It is believed that several warships will be shortly fitted with the apparatus. It is proposed to fit out some of the vessels, which are to take part in the winter naval manoeuvres. If the new system can be successfully applied to warships, the United States Navy would be at an advantage over many other fleets, as the oil could be taken aboard by pipes direct from the seashore at several points.

MILITARY.

Lord Kitchener is expected to arrive in England immediately, but he will leave again almost at once to take up his new duties as Commander-in-Chief in India.

Major-General the Earl of Dundonald is expected to arrive in Canada about the middle of this month to take up his new appointment as Commander of the Dominion troops.

Colonel G. Grant-Dalton, half-pay, has been appointed to command the West Yorkshire (14th) Regimental District, in place of Colonel A. W. Noyes, retired under the age rules.

The King has been pleased to approve the promotion of Lieut.-General Lord Kitchener of Khartoum, G.C.B., G.C.M.G., Commander-in-Chief in South Africa, to the rank of General.

The Canadian Coronation contingent, numbering 620, and representing every regiment in Canada, disembarked from the *Parisian* at Liverpool on the 17th ult.

General Sir George White, who in the ordinary course would be retired from the army for age on July 6, is to be retained in his appointment as Governor and Commander-in-Chief of Gibraltar until January 6, 1905.

Colonel W. S. Clarke, now acting as Assistant Adjutant-General in the Western District, has been selected for command of the Worcestershire (29th) Regimental District, to succeed Colonel H. J. de B. de Berniere.

The King has been pleased to confer the dignity of a Viscounty upon Lieut.-General Lord Kitchener of Khartoum, G.C.B., G.C.M.G., Commander-in-Chief of His Majesty's Forces in South Africa.

Colonel Edward Dickinson, Royal Engineers, who has been Assistant Adjutant-General at the War Office since June, 1899, is to have the position of Chief Engineer (Colonel on the Staff) of H.R.H. the Duke of Connaught's Third Army Corps in Ireland.

Brigadier-General W. H. Manning, Inspector-General of Military Forces of African Protectorates administered by the Foreign Office, has returned to England on the conclusion of an official tour through Uganda and the East African Protectorate.

METRICAL WEIGHTS AND MEASURES.

TABLES FOR CONVERTING METRICAL WEIGHTS AND MEASURES.

HECTARE.	ACRE.	KILO-MÈTRE.	ENG. MILE.	KILO-MÈTRE.	ENG. MILE.
0.405	1	2.471	1.609	1.609	1.000
0.809	2	4.942	3.219	3.219	2.000
1.214	3	7.413	4.828	4.828	3.000
1.619	4	9.885	6.438	6.438	4.000
2.023	5	12.356	8.047	8.047	5.000
2.428	6	14.827	9.656	9.656	6.000
2.833	7	17.298	11.265	11.265	7.000
3.237	8	19.769	12.875	12.875	8.000
3.642	9	22.240	14.484	14.484	9.000
4.047	10	24.711	16.093	16.093	10.000
8.093	20	49.423	32.186	32.186	20.000
12.140	30	74.134	48.279	48.279	30.000
16.187	40	98.846	64.373	64.373	40.000
20.234	50	123.557	80.466	80.466	50.000
24.280	60	148.268	96.559	96.559	60.000
28.327	70	172.980	112.652	112.652	70.000
32.373	80	197.692	128.745	128.745	80.000
36.420	90	222.403	144.839	144.839	90.000
40.467	100	247.114	160.932	160.932	100.000

MÈTRE.	VARD.	KILO-GRAMME.	LB. AVOIR.	LITRE.	GAL- LONS.
0.914	1	1.094	2.20	4.54	1.022
1.829	2	2.187	4.41	9.09	2.044
2.743	3	3.281	6.61	13.63	3.066
3.658	4	4.374	8.82	18.17	4.088
4.572	5	5.468	11.02	22.72	5.110
5.486	6	6.562	13.23	27.26	6.132
6.401	7	7.655	15.43	31.80	7.154
7.315	8	8.749	17.64	36.35	8.176
8.229	9	9.843	19.84	40.89	9.198
9.144	10	10.936	22.05	45.43	10.220
18.288	20	21.873	44.09	90.87	20.440
27.432	30	32.809	66.14	136.30	30.660
36.576	40	43.745	88.18	181.74	40.880
45.719	50	54.682	110.23	227.17	51.100
54.863	60	65.618	132.28	272.61	61.320
64.007	70	76.554	154.32	318.04	71.540
73.151	80	87.491	176.37	363.47	81.760
82.295	90	98.427	198.42	408.91	91.980
91.438	100	109.363	220.46	454.35	102.200

For the use of these tables the following explanation is necessary:—The figures in heavier type represent either of the columns beside it, as the case may be; viz., with hectares and acres in the first set of columns, 1 acre=0.405 hectare, and vice versa, 1 hectare=2.471 acres, and so on.

STATISTICAL NOTES.

New Zealand.—TRADE.—The following tables, taken from the *New Zealand Trade Review*, show the import and export trade for the three years, 1899-1900, 1900-1, and 1901-2:—

I.—VALUES OF IMPORTS INTO NEW ZEALAND during the years ended 31st March, 1902, 1901, and 1900 respectively; specie and parcels post to all ports being stated separately:—

Ports.	1901-2.	1900-1.	1899-1900.
NORTH ISLAND—			
Auckland	2,931,952	2,612,707	2,191,600
Wellington	2,894,654	2,717,270	2,119,313
Other North Island Ports.	503,303	501,024	450,087
SOUTH ISLAND—			
Dunedin	2,002,808	2,124,840	1,921,877
Lyttelton	2,004,432	1,836,458	1,523,517
Other South Island Ports.	802,389	797,619	694,725
Total North Island	6,329,909	5,831,001	4,761,000
Total South Island	4,809,629	4,758,917	4,140,119
Specie to all Ports	352,755	509,394	221,817
Parcels Post	112,428	91,716	69,925
Total Colony	11,604,721	11,191,028	9,192,861
Total apart from Specie	11,251,966	10,681,634	8,971,044

The totals for the two Islands, it will be seen, compare as follows, apart from specie and parcels:—

Year.	North Island.	South Island.	Parcel Post.
1901-2	6,329,909	4,809,629	112,428
1900-1	5,831,001	4,758,917	91,716
1899-1900	4,761,000	4,140,119	69,925

During the last two years the increase has been heaviest in the North Island, though for the preceding twelvemonth it was the larger in the South Island.

II.—VALUE OF EXPORTS from New Zealand during the years ended 31st March, 1902, 1901, and 1900 respectively; specie and parcels post from all ports being stated separately:—

Ports.	1901-2.	1900-1.	1899-1900.
NORTH ISLAND—			
Auckland	1,952,145	1,934,345	1,903,644
Wellington	1,888,181	2,146,906	2,161,759
Napier	604,399	896,394	893,829
Other North Island Ports.	1,401,812	1,415,515	1,374,026
SOUTH ISLAND—			
Lyttelton	2,464,570	2,259,578	2,603,111
Dunedin	1,341,534	1,458,711	1,400,899
Bluff	864,856	812,781	771,043
Timaru	745,707	714,855	944,492
Other South Island Ports.	869,271	861,267	851,447
Total North Island	5,846,537	6,393,160	6,333,258
Total South Island	6,285,938	6,107,192	6,570,992
Specie from all Ports	9,660	21,957	15,423
Parcels Post	15,891	13,211	11,086
Total, Colony	12,158,026	12,535,520	12,930,759
Total apart from Specie	12,148,366	12,513,563	12,915,336

The total, apart from specie, as shown in the second table, exhibits a falling-off of £365,197, the North Island showing a decrease of £546,623, while the South Island has an increase of £178,746. In the South Island, every line but Dunedin shows an increase.

III.—VALUES OF THE PRINCIPAL CLASSES OF PRODUCE EXPORTED during the years ended 31st March, 1902, 1901, and 1900 respectively:—

Goods.	1901-2.	1900-1.	1899-1900.
Wool	3,118,181	3,906,739	4,745,653
Meats—Frozen	2,232,385	2,246,859	2,168,956
Preserved	99,200	97,573	89,114
Cured and Salted	26,155	25,521	24,695
Tallow	400,837	344,891	334,621
Butter	983,224	790,169	693,656
Cheese	189,992	248,883	208,258
Sheep skins	270,022	252,588	259,997
Rabbit skins	57,861	43,875	79,430
Sausage skins	42,148	42,356	41,057
Live stock	17,832	21,927	36,557
Hides	45,239	41,335	40,299
Leather	111,972	104,989	104,887
Gold	1,680,383	1,516,482	1,526,351
Silver	67,954	42,907	39,289
Kauri gum	486,484	553,468	580,002
Timber	266,481	246,675	209,920
Coal	121,922	118,148	77,648
Grain—Wheat	234,775	339,375	390,541
Oats	761,483	565,649	401,064
Barley	16,096	29,796	13,680
Malt	22,274	44,219	52,829
Maize	7,130	29,908	*
Beans and peas	25,507	24,537	13,296
Flour	5,713	10,062	20,808
Pollard, bran, and oatmeal.	34,509	43,422	41,024
Grass seed	73,585	98,205	57,604
Potatoes	90,691	25,543	37,982
Hops	16,533	14,936	27,583
New Zealand Hemp	268,320	251,134	266,702
Fish	20,446	21,070	22,258
Fungus	11,230	8,298	9,544
Apparel	6,609	3,389	3,701
Woollens	7,938	9,452	7,568
Other New Zealand produce	152,655	143,907	155,965
Total N.Z. produce	11,972,866	12,348,287	12,782,639
Re-exports	175,500	165,276	132,697
Specie	9,660	21,957	15,423
Totals	12,158,026	12,535,520	12,930,759

* Included in "Other New Zealand produce."

The quantities of the more important items of the table compare as follows with preceding years:—

	1901-2.	1900-1.	1899-1900.
Wool lb.	142,246,848	136,715,211	143,528,294
Frozen meat cwt.	1,871,731	1,921,132	1,936,821
Preserved meat "	37,903	43,761	46,822
Tallow tons.	17,978	16,840	17,674
Butter cwt.	219,493	184,550	161,795
Cheese "	86,476	109,156	98,003
Kauri gum tons	8,282	8,795	10,268
Wheat bushels	1,964,923	2,734,000	3,354,211
Oats "	8,587,487	6,193,794	4,647,476
Hemp tons	12,230	12,893	13,251

India.—FOREIGN TRADE.—The following tables, taken from the Trade and Navigation Accounts of British India, show the imports and exports of 1901-02, as compared with those of 1900-01:—

SUMMARY.

I.—IMPORTS INTO BRITISH INDIA FROM FOREIGN COUNTRIES.

	Twelve months, 1st April to 31st March.		
	1900-01.	1901-02.	+ Increase. - Decrease.
	R	R	R
I. Animals, living	48,73,197	46,65,638	- 2,07,559
II. Articles of food and drink—			
Sugar	5,65,52,163	5,85,28,650	+ 19,76,487
Other articles	6,41,73,249	5,85,42,626	- 56,30,623
III. Metals and manufactures of—			
Hardware and cutlery, including plated ware	1,84,14,739	1,70,66,371	- 13,48,368
Metals	6,43,14,853	6,90,44,301	+ 47,29,448
Machinery and millwork	2,25,75,592	3,00,58,802	+ 74,83,210
Railway plant and rolling-stock (other than Government stores).	1,34,11,195	1,53,64,301	+ 19,53,106
IV. Chemicals, drugs, medicines and narcotics, dyeing and tanning materials	2,22,56,241	2,40,95,828	+ 18,39,587
V. Oils—			
Mineral	3,45,78,528	3,83,73,943	+ 37,95,415
Other oils	29,91,670	38,12,332	+ 8,20,662
VI. Raw materials and unmanufactured articles	3,70,75,368	3,81,65,904	+ 10,90,536
VII. Articles manufactured and partly manufactured—			
Cotton yarn	2,48,92,147	2,64,70,267	+ 15,78,120
Cotton piece-goods	26,24,26,143	29,15,16,269	+ 2,90,90,126
Other articles	13,42,43,768	13,90,00,144	+ 47,56,376
Total merchandise	76,27,78,853	81,47,05,376	+ 5,19,26,523
Gold	11,87,13,827	8,29,76,205	- 3,57,37,622
Silver	4,59,22,253	11,35,07,591	+ 6,75,85,338
Grand total of Imports	92,74,14,933	101,11,89,172	+ 8,37,74,239

II.—EXPORTS FROM BRITISH INDIA TO FOREIGN COUNTRIES.

	R	R	R
Foreign merchandise exported	3,20,85,314	3,26,03,248	+ 5,17,934
Indian merchandise exported:—			
I. Animals, living	21,87,491	21,39,504	- 47,987
II. Articles of food and drink—			
Rice	13,21,91,491	13,68,67,930	+ 46,76,439
Wheat and wheat-flour	38,84,008	3,63,40,112	+ 3,24,56,104
Tea	9,55,09,301	8,14,94,893	- 1,40,14,408
Other articles	3,14,60,544	3,61,64,990	+ 47,04,446
III. Metals and manufactures of—	42,81,895	29,99,020	- 12,82,875
IV. Chemicals, drugs, medicines and narcotics, dyeing and tanning materials—			
Opium	9,45,54,357	8,52,29,854	- 93,24,503
Indigo	2,13,59,808	1,85,22,554	- 28,37,254
Other articles	1,29,69,131	1,48,59,504	+ 18,90,373
V. Oils	65,65,180	69,17,567	+ 3,52,387
VI. Raw materials and unmanufactured articles—			
Cotton	10,12,74,007	14,42,60,933	+ 4,29,86,926
Hides and skins	6,98,84,518	5,57,66,387	- 1,41,18,131
Jute	10,86,77,362	11,79,72,723	+ 92,95,361
Oilseeds	8,82,05,821	16,16,07,813	+ 7,34,01,992
Other articles	5,91,18,627	5,87,78,269	- 3,40,358
VII. Articles manufactured and partly manufactured—			
Cotton yarn	4,17,05,891	9,31,66,944	+ 5,14,61,053
Cotton piece-goods	1,43,32,297	1,42,54,982	- 77,315
Hides and skins	4,49,41,853	2,65,40,461	- 1,84,01,392
Jute—bags and cloth	7,79,02,073	8,61,97,919	+ 82,95,846
Other articles	3,05,99,129	2,82,54,347	- 23,44,782

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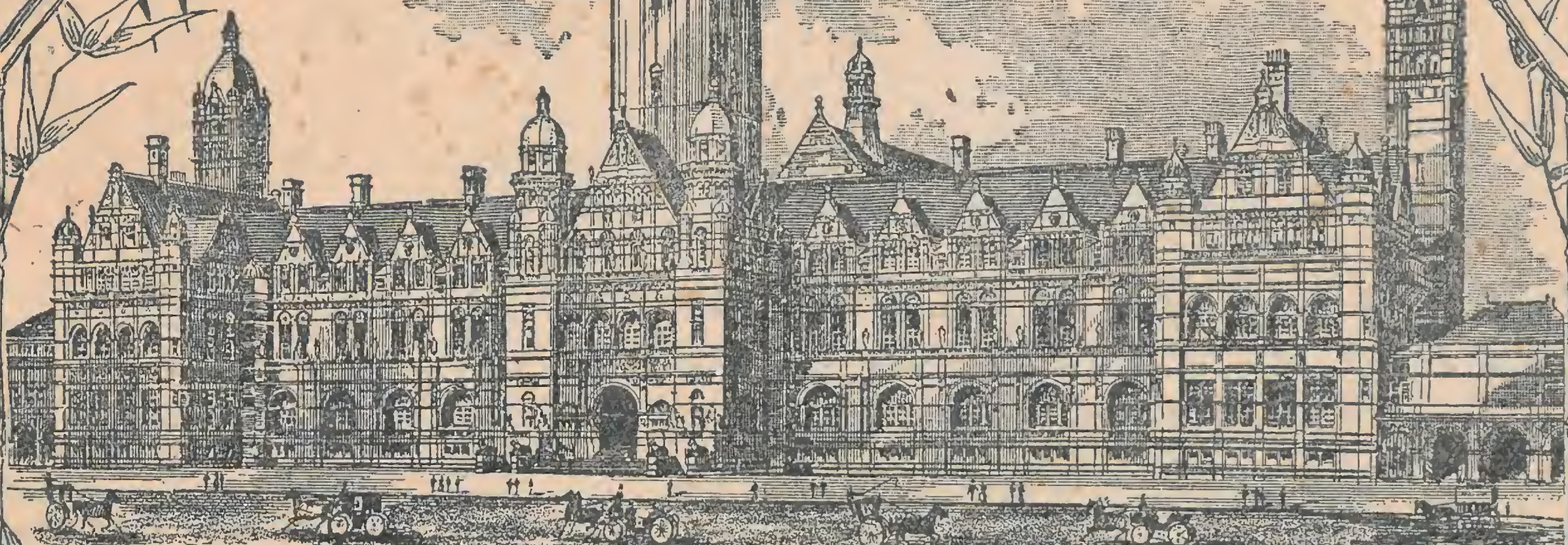
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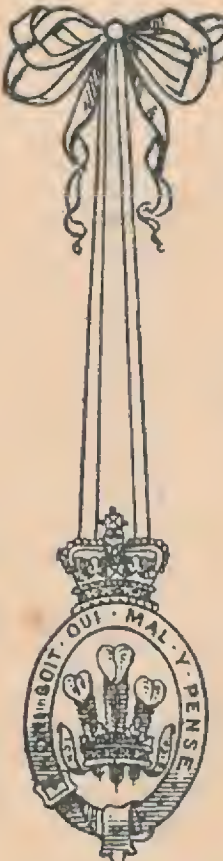
STRAITS
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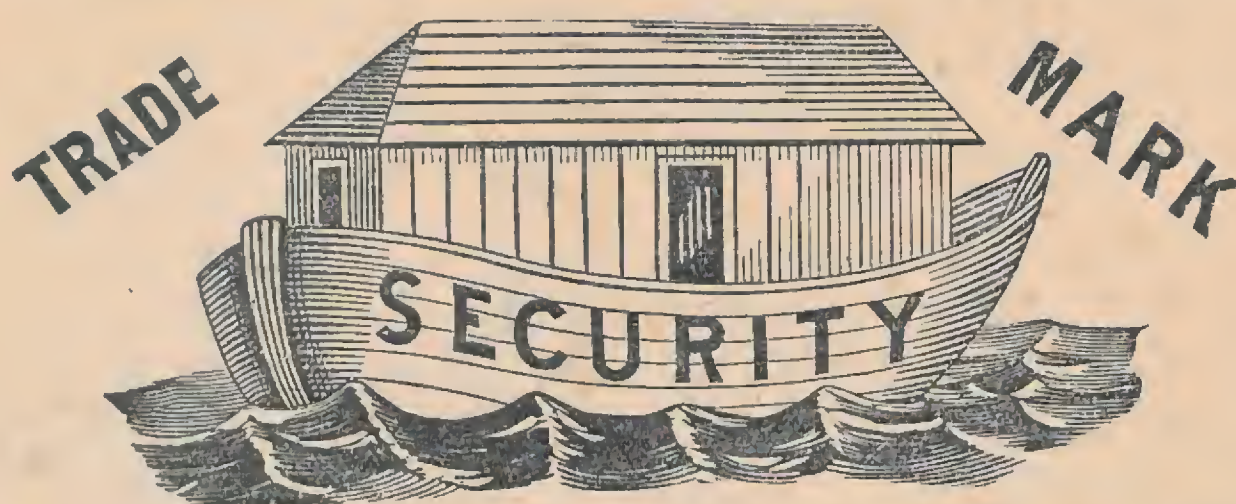
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BERMUDA.

(Middle of Central Lower Gallery.)

Representative Governor.—Gen. SIR ROBERT BIDDULPH, G.C.B., G.C.M.G.

Corresponding Agent.—THE COLONIAL SECRETARY.

Products Exhibited.—Arrowroot, woods, silk, shell-work, and sandstone.

WEST INDIES.

(West Central Lower Gallery.)

BRITISH GUIANA, TRINIDAD, AND TOBAGO.

Representative Governor.—The Rt. Hon. the LORD STANMORE, G.C.M.G.

Corresponding Agent.—Trinidad and Tobago: THE COLONIAL SECRETARY.

Curator of Collection.—(In charge of Institute Staff.)

Products Exhibited.—Arrowroot, cereals and pulses, medicinal barks, cocoa, coral, coffee, indigenous timbers, lace, fibres, rum, spices, starches, sugars, timber, leather, skins, drugs, fish glue, basket-work, condiments, etc.

JAMAICA AND BAHAMAS, WINDWARD ISLANDS, AND BARBADOS.

Representative Governor.—Field Marshal SIR HENRY W. NORMAN, G.C.B., G.C.M.G.,
Corresponding Agent.—Jamaica: THE INSTITUTE OF JAMAICA. [C.I.E.]

Hon. Curator.—[VACANT.]

Products Exhibited.—Arrowroot, barks, cocoa, coral, coffee, indigenous timbers, lace-bark, fibres, rum, spices, starches, sugars, sarsaparilla, wax, oils, condiments, turtle, etc.

BRITISH HONDURAS.

Representative Governor.—J. McMURRICH CURRIE, Esq.

Corresponding Agent.—[VACANT.] *Hon. Curator of Collection.*—J. M. CURRIE, Esq.

Products Exhibited.—Banana and cassava meal, cocoanut oil, coffee, horns (deer), indiarubber, Indian corn, medicinal barks, pickles, preserved fruits, rice, rope and cordage of native manufacture, rum, seeds edible and ornamental, spices, sponges, sugar, mahogany and other timbers, tobacco, etc.

LEEWARD ISLANDS.

Representative Governor.—[VACANT.]

Corresponding Agents.—Grenada: THE COLONIAL SECRETARY.

St. Vincent: THE ADMINISTRATOR. *St. Lucia:* MR. T. H. DIX.

Products Exhibited.—Arrowroot, barks, cocoa, coral, coffee, indigenous timbers, fibres, rum, spices, starches, sugars, etc., etc.

FALKLAND ISLANDS. (Middle of Central Lower Gallery.)

Representative Governor.—Gen. SIR ROBERT BIDDULPH, G.C.B., G.C.M.G.

Corresponding Agent.—THE COLONIAL SECRETARY.

Products Exhibited.—Wool, birds' skins and eggs.

BRITISH AUSTRALASIA.

NEW SOUTH WALES.

(East Central Upper and Lower Galleries.)

Representative Governor.—The Hon. HENRY COPELAND (Agent-General).

Corresponding Agent in Colony.—(At present through Agent-General's Office.)

Products Exhibited.—Minerals (including gold, silver, coal, &c.), wool, indigenous timbers, wines, cereals, seeds, gums, resins, oils, fibres, rope, leather, tallow, etc., etc.

VICTORIA.

(East Central Upper and Lower Galleries.)

Representative Governors.—HOWARD SPENSLEY, Esq., and [VACANT]

Corresponding Agents in Colony.—(At present through Agent-General's Office.)

Officer in Charge of Collection.—Mr. A. G. BERRY (of the Agent-General's Office.)

Products Exhibited.—Animals, birds, coal, cereals, chemical manufactures, cigars, essential oils, gums, grain, hops, indigenous timbers, leather, leatherware, minerals (including auriferous quartz, coal, kaolin, etc.), models of gold nuggets, seeds, sugar, tobacco, wines, wool, etc., etc.

SOUTH AUSTRALIA.

(East Central Lower Gallery.)

Representative Governors.—H. A. GRAINGER, Esq. (Agent-General), and HENRY BULL TEMPLAR STRANGWAYS, Esq.

Corresponding Agent in Colony.—(At present through Agent-General's Office.)

Officer in charge of Collection.—Mr. EDMUND SNELL (of the Agent-General's Office.)

Products Exhibited.—Agricultural produce, wines, indigenous timbers, furniture, wool, etc.

QUEENSLAND (AND BRITISH NEW GUINEA).

(East Central Lower Gallery.)

Representative Governors.—The Hon. SIR HORACE TOZER, K.C.M.G. (Agent-General), and Field Marshal SIR HENRY W. NORMAN, G.C.B., G.C.M.G., C.I.E.

Corresponding Agent in Colony.—(At present through Agent-General's Office.)

Curator of Collection.—(In charge of Institute Staff.)

Products Exhibited.—Building stones, eucalyptus oils, fibres, minerals, pearl shells, indigenous woods, cereals, models of fruits, sugar, wine, tinned meats, hides, skins, leather, etc., etc.

WESTERN AUSTRALIA. (East Central Lower Gallery.)

Representative Governor.—The Hon. H. B. LEFROY (Agent-General).

Corresponding Agent in Colony.—(At present through Agent-General's Office.)

Curator of Collection.—(In charge of Institute Staff.)

Products Exhibited.—Wools, gums and resins, olive oil, fibrous barks, silk, skins, indigenous woods, minerals, model gold ingots, etc., etc.

TASMANIA. (East Central Lower Gallery.)

Representative Governor.—The Hon. ALFRED DOBSON (Agent-General).

Corresponding Agent in Colony.—Mr. T. C. JUST, Chief Secretary's Office, Hobart.

Curator of Collection.—(In charge of Institute Staff.)

Products Exhibited.—Cereals, minerals, models of fruits, stuffed fish, furs, timbers, illustrations of local manufactures, etc., etc.

NEW ZEALAND. (East Central Lower Gallery.)

Representative Governors.—The Hon. W. P. REEVES (Agent-General), and THOMAS MACKENZIE, Esq. *Corresponding Agent in Colony.*—(At present through Agent-General's Office.)

Curator of Collection.—(In temporary charge of Institute Staff.)

Products Exhibited.—Agricultural produce, building stones, coal, Kauri gum, hemp and flax, tinned meats, wools, tobacco, Kauri and other woods, with illustrations of their application to structural and ornamental purposes; photographs, etc., etc.

FIJI. (Middle of Central Lower Gallery.)

Representative Governor.—Gen. SIR ROBERT BIDDULPH, G.C.B., G.C.M.G.

Corresponding Agent in Colony.—Hon. JOHN HILL, Suva.

Curator of Collection.—(In charge of Institute Staff.)

Products Exhibited.—Barks, fibres, copra, tea, cocoa, coffee, timbers, etc.

BRITISH INDIA (AND ASIA).

INDIA (East Gallery and Pavilion.)

Representative Governors.—Vide p. 200.

Special Sub-Committee, in charge of the Indian Section (appointed by the Secretary of State for India in Council):—*Chairman:* Major-General SIR OWEN TUDOR BURNE, G.C.I.E., K.C.S.I.

Members: SIR GEORGE C. M. BIRDWOOD, K.C.I.E., C.S.I.; G. W. VIDAL, Esq., I.C.S.; SIR E. C. BUCK, K.C.S.I.; W. COLDSTREAM, Esq., I.C.S., B.A.; C. H. MOORE, Esq.; T. W. HOLDERNESS, Esq., C.S.I.; SIR CHARLES J. LYALL, K.C.S.I., C.I.E.; Major-General JAMES WATERHOUSE.

Secretary: Mr. J. R. ROYLE, C.I.E.

Channel of Correspondence.—THE REVENUE AND AGRICULTURAL DEPARTMENT, INDIA.

Curator of Collection.—Mr. J. R. ROYLE, C.I.E.

Products Exhibited.—Fodder grasses, foods and food stuffs, sugar, spices and condiments, models of fruits, narcotics (including opium, ganja, etc.), tobacco and cigars, tea and coffee, oils and oil-seeds (including those of castor, sesamum, linseed, cocoa-nut and ground nut, etc.), a large assortment of drugs, dyes and tans, gums and resins (including the resins and turpentine of Indian pines, wax, lac, etc.), an extensive collection of fibres (including cotton, silk, jute, coir, rhea, agave, etc.), models illustrating the manufacture of cotton and jute, minerals (including building stones, coal, mica, soapstone, corundum, iron ores, steel, etc.), timbers, collection of Indian pottery, carved woodwork, silver, brass and copper ware, silk and cotton fabrics.

CEYLON. (East Gallery.)

Representative Governor.—The Rt. Hon. the LORD STANMORE, G.C.M.G.

Executive Officer and Home Agent.—FREDK. H. M. CORBET, Esq., Barrister-at-Law.

Curator of Collection.—Mr. J. R. ROYLE, C.I.E.

Products Exhibited.—Cereals, pulses, edible fruits, roots and grains, spices and condiments, drugs, horns, skins, pearls, shells, wax, oils, gums, resins, dyes, tans, fibres, timbers, building stones, plumbago, metallic ores, rough gems, palm products, tea, coffee, cocoa, cinchona bark, sugar, tobacco, cotton-cloth, mats, rattan and basket work, wood and ivory carving, metal-work, pottery, tortoise-shell and porcupine quill work, lacquer work, lace, etc., etc.

STRAITS SETTLEMENTS (AND JOHOR).

(East Gallery.)

Representative Governor.—SIR CECIL CLEMENTI SMITH, G.C.M.G.

Corresponding Agents.—The COLONIAL SECRETARY (at Singapore); The Dato JAMES MELDRUM (for Johor).

Curator of Collections.—(In charge of Institute Staff.)

Products Exhibited.—Barks, canes, drugs, fibres, preserved fruits (including Singapore pine-apples), mats, silk fabrics, oils and oil-seeds, dyes and tans, gums, gutta-percha, tin ores and other minerals, teas, coffee, spices, timbers, etc., etc.

MAURITIUS (AND SEYCHELLES).

(West Central Lower Gallery.)

Representative Governor.—[VACANT.]

Corresponding Agent in Colony.—Mr. A. DARUTY DE GRANDPRÉ, Museum Superintendent.

Corresponding Agent for Seychelles.—The Hon. E. B. SWEET-ESCOTT, C.M.G., Administrator.

Curator of Collection.—(In charge of Institute Staff.)

Products Exhibited.—Fibres, hemp, oils, rum, seeds, sugars, tortoise-shell, vanilla beans, with specimens of native workmanship, etc., etc.

HONG KONG. (Middle of Central Lower Gallery.)

Representative Governor.—SIR WILLIAM ROBINSON, G.C.M.G.

Corresponding Agent in Colony.—THE HARBOUR MASTER.

Curator of Collection.—(In charge of Institute Staff.)

Products Exhibited.—China, carved and inlaid ivory and wood-work, silver and lacquer ware, silk and cotton fabrics, drugs, paints, dyes, food stuffs, etc., etc.

BRITISH NORTH BORNEO. (West Central Lower Gallery.)

Corresponding Agent.—(At present through the British North Borneo Co.)

Curator of Collections.—(In charge of Institute Staff.)

Products Exhibited.—Timbers, rattans, coal, rice, sago, sugarcane and raw sugar, coffee, cocoa pods, pepper, tobacco, beeswax, camphor, gutta-percha, kapok fibre, dammars, cutch and gambier, hemp, honey, etc.

BRITISH POSSESSIONS (EUROPE).

MALTA, GIBRALTAR, AND CYPRUS.

(West Central Gallery.)

Representative Governor.—Gen. SIR ROBERT BIDDULPH, G.C.B., G.C.M.G.

Corresponding Agent.—(At present through the Representative Governor.)

Curator of Collections.—(In charge of Institute Staff.)

Products Exhibited.—From Malta—Carved stone-work, lace, macaroni, honey, various fabrics, models, pictures, etc., etc. Gibraltar and Cyprus—None at present.

IMPERIAL INSTITUTE JOURNAL.

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AUGUST, 1902.

GENERAL NOTICES.

"THE IMPERIAL INSTITUTE JOURNAL."

Fellows resident in the United Kingdom, the Colonies, India, and Foreign Countries, are supplied with the JOURNAL free by post each month.

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The JOURNAL may also be purchased for Sixpence each copy at the Ticket Office of the Institute and at the railway book-stalls of Messrs. WILLING & CO.

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Communications respecting Advertisements should be addressed to the ADVERTISEMENT MANAGER, 6, Arundel-street, Strand, London, W.C.

 This JOURNAL is distributed (by post) throughout the United Kingdom, India, and the Colonies of the British Empire, and to the following Foreign Countries:—Argentine Republic, Austria-Hungary, Belgium, Bolivia, Chili, China, Colombia, Costa Rica, Denmark, Egypt, France, Germany, Greece, Hawaiian Islands, Holland, Italy, Japan, Mexico, Montenegro, Morocco, Norway, Persia, Peru, Portugal, Russia, Siam, Spain, Sweden, Switzerland, Tripoli, Turkey, United States of America, Uruguay, and Venezuela. The JOURNAL is also placed in the Reading Rooms of CHAMBERS OF COMMERCE, CLUBS, and HOTELS, both at home and abroad.

IMPORTANT NOTICE

TO

ANNUALLY PAYING FELLOWS.

The Bill transferring the property and Government of the Imperial Institute to the Nation has become Law.

After the 1st of January, 1903—when the Act comes into operation—subscribing Fellows will cease to exist as such.

No further subscriptions can therefore be received, and it is suggested that any standing orders that may have been given to Bankers or Agents for the payment of the annual subscription should be cancelled by Fellows.

SPECIAL EXHIBITION OF COLONIAL PRODUCTS AND INDUSTRIES.

A Special Exhibition of Collections illustrative of the Mineral Wealth and of certain Industries of the DOMINION OF CANADA, also of commercial products from QUEENSLAND, RHODESIA, WESTERN AUSTRALIA, and BRITISH NORTH BORNEO, is on view in the western half of the North Gallery, from 11 a.m. to 5 p.m., on week-days—Admission Free.

COMMERCIAL COLLECTIONS.

The Galleries containing the Colonial and Indian Collections, and the Public Commercial and Industrial News Room, are open for free inspection by the public daily, except Sundays, and any days specially notified, from 11 a.m. until 5 p.m. Every information concerning the products, their supply, etc., can be obtained on application to the Curators of the Indian and Ceylon, Canadian, and South African Sections, to the general Curator, and to the Commercial Intelligence Department.

FELLOWS' DEPARTMENT.

The Reading, Writing, and News Rooms, are open for the use of Fellows every week-day from 10 a.m. till 11.30 p.m., and on Sundays from 3 p.m. to 10.30 p.m. The Library (on the First Floor), is open from 10 a.m. to dusk on Week-days, and from 3 p.m. to dusk on Sundays. The Map Room (First Floor) is open from 10 a.m. to 5 p.m. on Week-days.

The Poste Restante is open every week-day for receipt and delivery of letters and parcels. Letters addressed to initials only are not received, except in reply to notices in the JOURNAL, under "Requirements" Registry. The General Post Office Pillar Box is cleared daily twelve times, between 10.10 a.m. and midnight. Light refreshments only are, for the present, provided in the Fellows' Rooms and at the bar of the Ceylon Kiosk.

EMIGRATION INFORMATION OFFICE.

The Office of the British Women's Emigration Association (see page 218), in the West Corridor, First Floor, is open daily from 10 a.m. to 4 p.m., and advice and information respecting emigration and openings in the Colonies may be obtained there free of charge. Enquiries of all kinds relating to the Colonies from intending Emigrants are dealt with in the Commercial Intelligence Department, and special information respecting Canada and the Cape Colony may also be obtained from the Curators for these Colonies, on application personally at their offices, or by letter.

SCIENTIFIC AND TECHNICAL DEPARTMENT.

The Scientific and Technical Department of the Institute has been established to acquire information by special enquiries and by experimental research, technical trials and commercial valuation regarding new or little known natural or manufactured products of the various Colonies and Dependencies of the British Empire and of foreign countries, and also regarding known products procurable from new sources, and local products of manufacture which it is desired to export. This work is carried out with a view to the creation of new openings in trade, or the promotion of industrial developments.

In the extensive and well-equipped series of Research Laboratories occupying the West Corridor of the Second Floor, a staff of skilled Chemists, under the direction of Professor Wyndham R. Dunstan, M.A., F.R.S., carry out the investigation of the chemical constitution and properties of new dye-stuffs, tanning materials, seeds and food-stuffs, oils, gums and resins, fibres, timbers, medicinal plants and products; animal products, minerals and ores, soils, cements, and various other products, with a view to their commercial utilization. Whenever necessary these materials are submitted to special scientific experts, by whom they are made the subjects of particular investigation or practical tests. Reports are also obtained from technical or trade-experts in regard to the probable commercial or industrial value of any such products, whilst full information is collected from official or other trustworthy sources regarding the probable extent and cost of available supplies. All materials requiring scientific or technical examination, or commercial valuation, should be submitted to the Institute for examination either by, or through the Foreign Office, the Colonial Office, the India Office, or the Board of Trade, or through the Colonial or Indian Government Authorities. Requests for the examination of such materials may also be submitted by Public Commercial Bodies and Institutions of the respective Colonies and Dependencies, or by the Representatives of H.M. Government in foreign countries.

COMMERCIAL INTELLIGENCE DEPARTMENT.

The Office of this Department, in the West Corridor, First Floor, is open daily from 10 a.m. to 5 p.m. (on Saturdays till 1 p.m.), for the purpose of answering enquiries and supplying information relating to the Commerce (Export and Import) and Industries of India and the Colonies. Applications may be made personally or by letter. Special information may be obtained from the Curators in charge of the Indian and of certain Colonial Collections. Arrangements have been made for the translation for mercantile firms of Trade Circulars, Price-Lists, and Catalogues into any Foreign Language, including the conversion of weights, measures and coinages, etc., at cost price, and application for such may be addressed to this Department.

CITY BRANCH OF THE IMPERIAL INSTITUTE.

REMOVAL TO 49, EASTCHEAP, E.C.

The City Enquiry Office and Reading Room have been removed from 112, Cannon-street to larger premises at 49, EASTCHEAP, where a commodious apartment is also provided for the display, to merchants, manufacturers, etc., of raw and manufactured products received, from time to time, from the Colonies and from India, and for which it is desired to find openings in British markets. Curators and other members of the Imperial Institute staff will attend at the Office, at stated times and by special appointment, to deal with enquiries and to assist in establishing or facilitating business relations with mercantile houses, etc., in the Colonies and India. The City Branch is in constant communication, by telephone and messengers, with the Imperial Institute, South Kensington. (For further information see page 216).

THE NORTHBROOK SOCIETY.

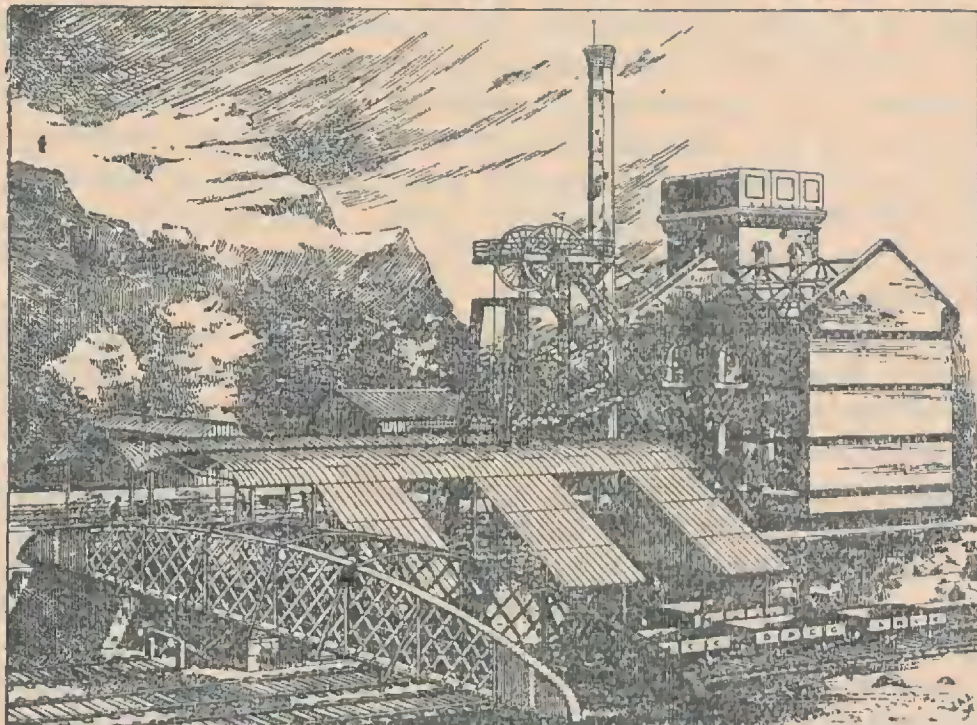
The Northbrook Society is affiliated to the Imperial Institute, and has a special room allotted for the exclusive use of its members in the Institute buildings. Its primary objects are to watch over and promote the interests of natives of India, and to provide a system of guardianship or supervision over such as are sent to Europe for education. The Society is controlled by a committee consisting of an equal number of Governors of the Imperial Institute and members of the Society, presided over by the Earl of Northbrook. It possesses an excellent library. Indian members, who pay no subscription to the Society, have the especial advantage of becoming Fellows of the Institute at half the usual subscription payable by the ordinary Fellows. Applications for membership of the Society should be addressed to the Secretary of the Northbrook Society, Imperial Institute, London, S.W.

"REQUIREMENTS" REGISTRY.

With the object of affording Fellows of the Imperial Institute, and the General Public resident in the United Kingdom, an opportunity of making known special "wants" or "needs" in the British Colonies, India, and Foreign Countries, space will be regularly devoted to approved notices in a column reserved for this purpose. Advertisers may have their replies addressed to them direct, c/o the Imperial Institute, London, S.W., under a distinctive number and initials. The cost of postage will be charged for the transmission of replies delivered at the Institute. Residents in the Colonies and India, and Foreign Countries, can register in like manner. (For further particulars see page 215).

IMPERIAL INSTITUTE JOURNAL.

An ornamental Cloth Cover, for binding the numbers of the JOURNAL for the year 1901 into one volume, may be obtained at the TICKET OFFICE of the INSTITUTE, or from Messrs. WATERLOW AND SONS LIMITED, Blomfield-house, London-wall, E.C., price 2s. 6d. An index and title-page to the volume were inserted in the January issue of the JOURNAL. Bound volumes of the JOURNAL for the seven years, 1895-1901, may be had at 10s. each.

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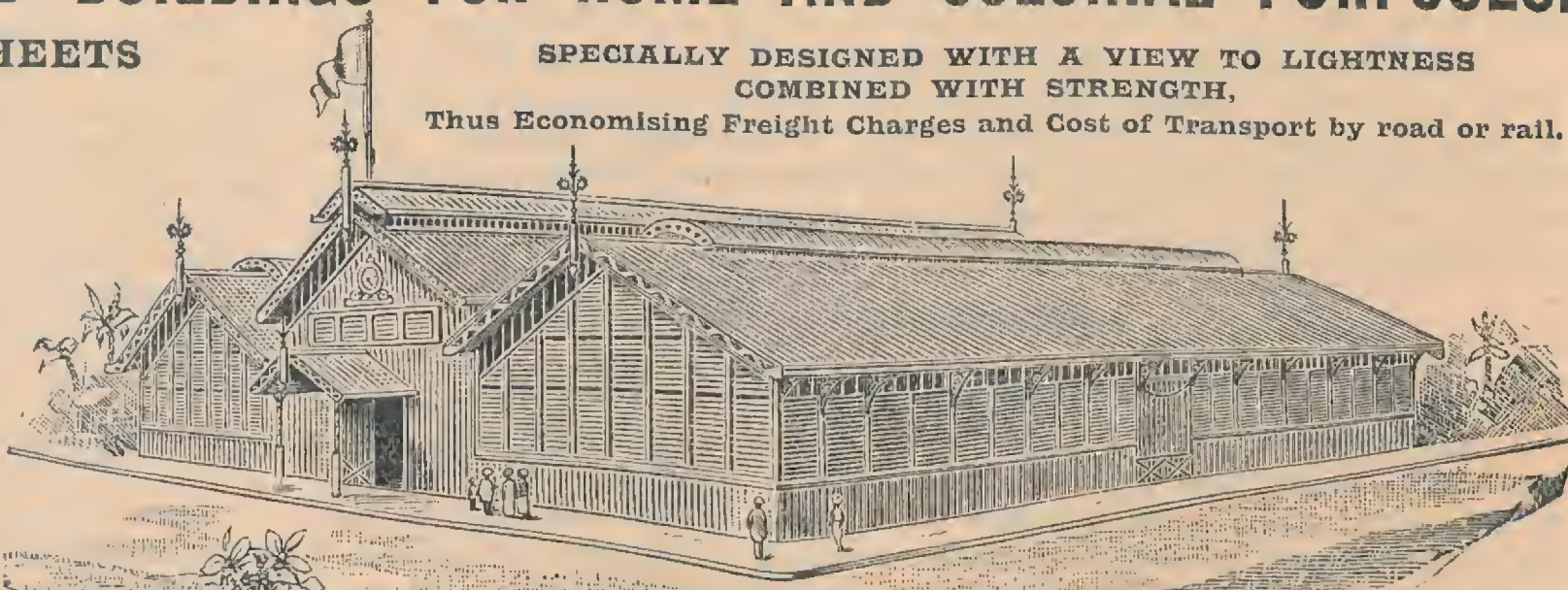
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ANNUAL MEETING OF THE IMPERIAL INSTITUTE.

The ANNUAL MEETING of the IMPERIAL INSTITUTE took place on June 20, at 4 p.m. The Chairman of the Governing Body, LORD JAMES OF HEREFORD, presided.

Addressing the members of the Institute, LORD JAMES said that he could not give expression to a feeling of entire satisfaction at meeting with them, owing to circumstances which had recently occurred, and which were probably known to most of those present. It was, presumably, the last occasion on which they would hold an Annual Meeting of the Fellows of the Institute in its general capacity; and it would be well, therefore, that Fellows should be briefly informed of the reasons which had led up to the important step recently taken by those who guide the destinies of the Institute—a step which, he felt sure, would be fraught with beneficial results to the whole Community.

It was well known to most of them that, in the early days of the Institute, a twofold policy had been adopted by the authorities. On the one hand, the support of the general public, and more especially of the local public, had been sought by the provision of high-class musical entertainments, which involved the engagement at very great expense during the Summer Seasons, of some of the best known Continental Orchestras; and, on the other hand, in accordance with the express wishes of Her late Majesty Queen Victoria, and those of our present King, the commercial and industrial interests of the outlying portions of our Empire were chiefly considered in the establishment of the magnificent group of Collections of Colonial products which the Institute possessed, and in the organization of the Departments of Commercial Intelligence and of Scientific and Technical Research. As time went on, it became more and more evident that the first portion of this policy had proved to be a failure, and the conclusion was forced upon the Council that this lighter side of their programme must be abandoned, and that their future efforts would have to be directed solely to the development of the far more serious and important work which was being carried out by the above-named Departments.

Having arrived at this decision, the Council at once took steps to develop and extend the sphere of operations of these two Departments. An Advisory Committee was formed, having among its members important Representatives of the Foreign Office, the Colonial Office, the India Office and the Board of Trade, and through those Representatives a Memorandum prepared by the Director of the Institute, descriptive of the work carried out by the Scientific and Technical Department, and by the Commercial Intelligence Department, was very widely circulated, through official channels, among the Indian and Colonial Governments, and also among the more important of His Majesty's Consuls abroad.

It was at this point that the Institute authorities found that they were working in direct competition with the newly-established Commercial Intelligence Department of the Board of Trade. The organization of that Department, the character of enquiries received by it, and the objects which it had in view, were in all respects similar to those with which the Imperial Institute Commercial Intelligence Department had been dealing for some years past—with, however, this difference—that the Board of Trade were enabled to carry on their operations on a larger scale, and, consequently, with far greater success than the Institute could hope to do. Being directly a Government Agency, the Board of Trade could attain their results by speedier and more effective methods than the Institute. But, while it undoubtedly lacked many of the advantages possessed by the Government Department, the Imperial Institute could place at the disposal of the Board of Trade certain facilities which would render the work of that body far more complete and efficient than it was at the present time. There were the extensive Collection-Galleries, containing the natural and manufactured products of forty-two groups of Colonies; and there were attached to the Institute excellent Chemical Laboratories, with a staff of skilled Chemists under the direction of Professor Dunstan. The Scientific and Technical Department, which had been established for the purpose of investigating new products from the Colonies, with a view to their commercial utilization, would assuredly prove a most valuable adjunct to the Board of Trade.

These considerations, coupled with the fact that the Institute was now entirely freed from pecuniary difficulties, had led the authorities to suggest that it should be incorporated with the Board of Trade. The counsel of the Governing Body was accordingly taken, and, at a largely attended meeting at York House on the 21st December last, presided over by His Royal Highness the PRINCE OF WALES, it was unanimously resolved that the Institute should be presented to the Nation, and a Committee was appointed to take the necessary steps for carrying the proposal into effect.

An important condition was, however, attached to the proposed transfer, viz., that, to whatever purposes His Majesty's Government might devote the Institute in the future, its original objects and purposes, as defined in its Charter of Incorporation, should be kept steadily in view—a condition which, it was believed, would be faithfully adhered to by the officials of the Board of Trade. The Bill which had been framed for the purpose of carrying into effect the Resolution passed at the Governors' Meeting of the 21st December, had now, with a few very slight alterations, passed its second reading in the House of Commons, and therefore, might virtually be said to have become law.

In conclusion, his Lordship reminded his audience that, while errors of policy might have been apparent in its past history, the Institute had of late years steadily developed and increased the efficiency of the more serious branches of its work; and he felt sure that the important step which they had taken would add materially to the usefulness of the Institute, which would, he hoped, in the future be universally regarded as an agency for doing the greatest possible good in all parts of the Empire.

SIR ROBERT HERBERT said that, while not wishing to add one word to the statement which Lord James had made to the Meeting, he believed that all present would desire to give expression to their personal gratitude to him for his unsparing efforts on behalf of the Institute, ever since he had succeeded the late Lord Herschell as Chairman of the Governing Body; and more especially did they wish to thank him for the successful manner in which the present negotiations had been carried out, mainly through the influence of Lord James. For this, as well as for his generous aid and counsel in the past, he tendered the hearty thanks of all the Governing Body.

Mr. WM. COLDSTREAM, in supporting the remarks of Sir Robert Herbert, expressed the hope that the interests of India, which, more than any other British Dependency, was so largely represented in the Institute, both in its Main Building and in its Galleries,—would be fully recognised. Upwards of £100,000 had been subscribed by the people of India towards the establishment of the Institute, and it was earnestly to be hoped, before the Institute passed into other hands, that some permanent record—taking, perhaps, the form of an inscription—should be made of the important part taken by the people of India some fifteen years ago in the foundation and establishment of the Institute.

LORD JAMES, replying, said that when the proposal to effect the transfer was first brought forward, Lord George Hamilton had been most anxious that no action should be taken which did not fully recognise their indebtedness to India; and Sir Owen Tudor Burne, as representing India upon the Transfer Committee, had repeatedly urged that some permanent record should be made of the large amount which India had subscribed towards the foundation of the Institute. Although it was premature to say anything definite on the subject, he would see that the attention of the Advisory Committee was called to the matter.

His Lordship heartily thanked his audience for the kind expressions to which Sir Robert Herbert had given utterance on their behalf, and reminded them that, far more than to himself, their thanks were due to Sir Frederick Abel, the Director of the Institute, who, since its foundation, had laboured with untiring zeal, and in the face of many difficulties, for the success of the Institute.

REPORT OF PROGRESS,

UP TO DATE, SINCE SUBMISSION OF THE ANNUAL REPORT TO THE MEETING OF THE INSTITUTE ON 2ND MAY, 1900.

Shortly after the return to England of the Prince of Wales from the memorable and most successful visit which His Royal Highness, in company with the Princess of Wales (as the Duke and Duchess of Cornwall) paid to the British Colonies, the Executive Council of the Imperial Institute acted on the proposal which had been favoured with the cordial approval of the King in April, 1901; and their invitation to the Prince of Wales to become President of the Institute was graciously accepted by His Royal Highness, who shortly afterwards presided over a special Meeting of the Governing Body, held at York House on the 21st December last, for the consideration of a very important proposal, which will be dealt with presently.

The steady progress and continuous development of the useful work carried on by the several Departments of the Institute since 1893, has been very satisfactorily maintained in 1901 and during the present year.

Many important measures of economy were reported last year as having been effected in 1900, without any detriment to the efficiency and possibility of extension of the Institute's operations. These had been rendered possible by the arrangements entered into with His Majesty's Government in the autumn of 1899, described in the Report of that year. Some additional reductions in expenditure effected during 1901 resulted in as satisfactory a financial condition being demonstrated by the Balance Sheet for the year as had existed in the previous year, notwithstanding that the income of the Institute in 1901 suffered a not inconsiderable further diminution under the head of "Fellows' Subscriptions"; these amounted to about £1,100 less than in 1900.

The excess of income over expenditure in 1901 was practically identical with that of the previous year, being a little more than £2,000, notwithstanding that a special expenditure of over £500 was incurred in the renovation of the Canadian, Indian, Ceylon, and Straits Settlements Sections of the Galleries, and in similar work upon the second floor of the Main Building, which is now entirely occupied by the Laboratories of

THE SCIENTIFIC AND TECHNICAL DEPARTMENT.

The work of this Department has very considerably increased in extent and importance during the past eighteen months, mainly in consequence of action taken by the Advisory Committee appointed in 1900, as detailed in the last Report of the Council.

This Committee, having approved of the extensive circulation of a Memorandum prepared by the Honorary Director and the Director of this Department, describing its operations and the possible scope of their utilization, it was decided to submit this Memorandum to the Secretaries of State for Foreign Affairs, for the Colonies, and for India, with the request that it might be distributed, with covering despatches from those Departments of the Government, to the Government Authorities of all the Colonies as well as to Colonial Chambers of Commerce and public Institutions, to the Consular Service, and to Indian Authorities and Institutions.

The representatives of those Government Departments upon the Advisory Committee undertook to promote the attainment of its wishes, with the result that the Memorandum has been very widely distributed in the proposed directions, under cover of despatches from the Secretaries of State well calculated to ensure attention being given to the description of the facilities offered by the Imperial Institute for the scientific examination, practical testing and commercial valuation of new or little known products, not only from different parts of the Empire, but also from all parts of the world.

The reduction made, in compliance with the Honorary Director's representation, in the amount at which the Indian Government was rated in respect of the expenses annually incurred by the Institute for attendants, cleaning, etc. in the Galleries, so as to place it on the same footing as the corresponding payments made by the Colonies, afforded an opportunity of impressing upon the Indian Authorities the inadequacy of the annual payment of £100, made for some years past towards defraying the expenditure upon apparatus, materials, etc. incurred in carrying out the extensive research work in connection with Indian products sent to the Institute for investigation and report. The representations made resulted eventually in the annual contribution by the Indian Government towards the expenses of the Scientific and Technical Department being raised to £200.

The Government of the Straits Settlements has announced its intention of granting a small sum annually to the Department for scientific and technical assistance in the investigation of natural products.

During the period under review there has been a considerable and steady increase in the work demanded by India and the Colonies from this Department, whilst, in addition, through the Foreign Office, scientific and technical enquiries have been made and samples of products submitted for investigation by many of our Consuls resident in foreign countries. This great increase in work has necessitated the appointment of two additional skilled assistants, making now ten in all employed in laboratory-work.

A variety of subjects for investigation has been submitted and enquiries made as to the commercial value of products of all kinds derived from India, Canada, Australia, the Crown Colonies, Egypt and the Soudan, whilst, as stated above, a number of products from Foreign countries have been submitted through the Foreign Office; and the War Office has sent for investigation certain plants which have proved poisonous to horses and cattle in South Africa.

Reports have been submitted on all these subjects, which may be summarised as follows:—

1. *India:* Gums, tanning materials, fibres, rubbers, medicinal plants, and minerals (twelve reports).

2. *The Colonies:* Oil seeds, indiarubber, and gutta-percha, tobacco, fibres, dye-stuffs, and minerals (twenty-five reports); the chief Colonies represented being Canada, Australia, Natal, Somaliland, Zululand, Grenada, Trinidad, Uganda, Fiji, New Zealand, Newfoundland, Bermuda, Southern Nigeria, Sierra Leone, and British Honduras.

Among the more important investigations still in progress may be mentioned:—

1. Certain abundant Indian plants with a view to their use as tanning agents.
2. Certain Indian plants with a view to their use in medicine.
3. The cause of the occasional poisonous action of certain Indian fodder plants and food-grains occurring in India and certain of the Colonies.
4. The examination of samples of Colonial indiarubber and gutta-percha and possible substitutes.
5. The examination of minerals from British Central Africa, Northern and Southern Nigeria.

A number of minerals from Foreign countries are also under investigation.

Of the scientific communications arising out of the work of the Department which have been published during this period there may be mentioned two papers, by Professor Dunstan and Dr. Henry, on the nature of the poison contained in certain fodder-plants and food-grains (*Lotus arabicus* from Egypt, and *Sorghum vulgare* from Egypt, India, and the West Indies) which have been published in the "Proceedings" and "Philosophical Transactions" of the Royal Society; and two papers on the chemistry and medicinal action of the Indian Aconites, which have also appeared in the "Philosophical Transactions" of the Royal Society.

During the present year it is intended to collect together and publish in a volume the principal scientific papers and technical reports which have been issued by this Department since 1896.

THE COLONIAL COLLECTIONS

have received many additions, and renewals in the form of samples of natural products sent to replace corresponding specimens of a perishable character which had deteriorated. Especially noticeable among these are the excellent samples of the most important products of the agricultural industries of the SEYCHELLES ISLAND, recently sent to the Institute by the Administrator, the Hon. E. B. Sweet-Escott, C.M.G., who is taking a most active interest in the representation of the resources of this Colony. These samples have been exhibited at the City Branch of the Institute at Eastcheap (to which further reference will presently be made) and have attracted much attention from produce brokers and merchants. Very favourable reports on their commercial value in the London market have been received.

In the BERMUDA Section, an admirable series of photographs of the scenery, industries, and points of attraction in the island is now displayed in the Court. An important addition has been made in the NEW ZEALAND Court in the form of a statement printed in prominent characters of statistical information relating to the progress and position of the trade and industries of the Colony. A similar statement relating to each Colony would form a most valuable addition to other sections of the Institute Collections. Some interesting samples of hard woods obtained from a forest in the EAST AFRICAN Protectorate, by H.M. Consul at MOMBASA, were received and examined and reported upon by Mr. H. Stone, one of the expert-referers on timbers to the Imperial Institute, who stated that the samples were a valuable series; one, a species of ebony, alone being valuable enough, if sufficiently plentiful, to justify the exploitation of the forests.

In the NEW SOUTH WALES Section the exhibits of Cereals have been renewed, and a very complete collection of Flours, etc., has been added. The QUEENSLAND Section has received very interesting additions to the collections of products, selected from last year's Exhibition at Glasgow, and a supplementary Exhibition of products (including a fine collection of opals and other gems from Queensland) forms part of a special Colonial Exhibition which has been installed in the North Gallery of the Institute.

A really magnificent collection of specimens of recent Cereal crops has just been received from SOUTH AUSTRALIA.

The International Exhibition at Glasgow included a Colonial Section, as part of the British Empire Exhibit, which more than rivalled the corresponding part of the British Section of the Paris Exhibition of 1900. In addition to the QUEENSLAND exhibits just referred to, there was a perfectly unique collection of minerals representing, upon a very extensive scale, that most important section of the natural resources of the DOMINION OF CANADA, while the resources of RHODESIA were also illustrated by a highly interesting and instructive collection, which included a number of exhibits borrowed from the Rhodesian Section of the Institute, established in 1900. WESTERN AUSTRALIA also exhibited a thoroughly representative illustration of its value in Gold, and very interesting examples of the important applications of Jarrah, Karri, and other West Australian woods, to industrial and ornamental purposes.

At the conclusion of the Glasgow Exhibition, endeavours were made to organise arrangements for transferring the exhibits of the British Colonial Section to London for public exhibition, which eventually resulted in the grant, by the City Authorities concerned, of the use of the Royal Exchange for this purpose for a limited period last Spring; the Collections from Canada, Western Australia, Rhodesia, and that of British North Borneo from the Imperial Institute, were arranged in that Building, and were supplemented by some local dealers in products from certain of the Colonies, forming a very attractive and instructive exhibition in the City, which was visited by large numbers of the commercial and general public.

The Prince of Wales, President of the Institute, having decided to allow of the public exhibition, at the Institute, of the Gifts and Addresses presented to His Royal Highness and to the Princess of Wales during their tour in the Colonies last year (the proceeds thereof to be presented to King Edward's Hospital Fund), arrangements were made for the exhibition, in one-half of the same Gallery, of the Canadian, Rhodesian, and North Borneo Collections, and of portions of the West Australian Collection shown in the Royal Exchange, to which were added the Queensland exhibits from the Glasgow Exhibition (already referred to). A number of specimens of Canadian furniture and carriages were added to the Canadian Section of this Special Colonial Exhibition, which has formed a very interesting addition to the general Colonial Collections of the Institute.

THE INDIAN SECTION

continues to be under the zealous administration of the Special Committee appointed by the Secretary of State for India, whose Secretary, the Curator of the Section, Mr. J. R. Royle, C.I.E., is also their Executive Officer. Sir Steuart C. Bayley having, to the great regret of the Committee and of the Institute Authorities, resigned the office of Chairman of the Committee, Sir Owen Tudor Burne has been appointed his successor by the Secretary of State. This Section has received important additions since the last annual report, through the Reporter on Economic Products, but its contents have, in addition, been considerably augmented by the transfer to it of a large proportion of the raw products, dyed fabrics, photographs, maps, etc., sent by the Government of India to the Paris Exhibition of 1900. There are now exhibited in the Galleries of the Section over 12,600 specimens of raw and manufactured products, after elimination of a number of old specimens, which had suffered deterioration. Among other additional accommodation for the exhibition of specimens, is a very large elaborately-carved show-case of blackwood, made for the Paris Exhibition at the Madras School of Art; this has been erected in the Pavilion, to which the collection representing the mineral resources of India has been transferred from the northern Gallery of the Section. Steps are being taken for the similar transfer of the Fibres-collection, so as to make room in the Gallery for other specimens of raw products recently received, and which are now in the sample-stores of the Section. The accommodation afforded by these has been much increased during the past year by the provision of additional racks and other fittings.

A considerable number of specimens of products has been supplied from the Indian Section to the Science and Art Department at Dublin, and to other Institutions, for educational purposes.

SOUTH AFRICAN SECTION.

The RHODESIAN Collection at the Institute now includes a considerable number of exhibits shown at Glasgow, which, as already stated, were removed this Spring to the Royal

Exchange for public exhibition, and have since been installed in the North Gallery of the Institute as part of a special Colonial Collection.

New offices have been erected for the Curator of the Cape Colony Section, which open into the Court of that Colony, and will shortly be used for conducting the business of the Section. Mr. Lewis Atkinson, the Curator, has been very much occupied during the past eighteen months with interviewing applicants desirous of emigrating to South Africa.

The Cape Government decided last year to send over two of their best informed Officials to give practical information to people wishing to settle in South Africa, and Dr. D. Hutcheon, Chief Veterinary Surgeon, and Eustace Pillans, Esq., Agricultural Assistant and Fruit-Expert, were engaged, with Mr. Atkinson, from May to October last year in interviewing a large number of people, giving them most valuable advice and assistance.

The Scottish Sharpshooters' Association decided to send one hundred young farmers to Cape Colony, and Mr. Atkinson has had to deal, in conjunction with Colonel Hill, the Managing Director of the Association, with about 900 applicants for these openings. Many of the men selected are now working on farms in South Africa, in the conquered territories.

Seeing that the large number of remounts which had to be sent out required good horse-attendants, and that the shipping companies simply engaged men by advertisement, it was arranged by the Cape Colony Authorities that Mr. Atkinson should undertake the selection of men who would be useful to South Africa, and make good attendants. These men received letters to enable them to get work on landing in the Colony, and the latest advices received are to the effect that every man who produced his letter to the proper Authorities gained employment at once.

Since the opening of the Imperial Institute, over a thousand good settlers and artisans have been assisted through the action of the Curator; in 1901 not less than 2,500 were personally interviewed, and furnished with information; in many cases, applicants received assistance and letters which have enabled them to secure employment in the Colony.

At the present time 700 artisans are being engaged for the Cape, for which purpose Mr. Atkinson is continuously occupied at the offices of the Agent-General for Cape Colony.

CANADIAN SECTION.

The Curator for CANADA, Mr. Harrison Watson (who has recently been appointed Agent-General for Prince Edward Island), has continued, with very useful results, his operations for the promotion and extension of trade-relations of Canadian manufacturers with the British markets, and his Annual Report (for 1901) to the Minister of Trade and Commerce, Ottawa, of the work carried out by him contains much interesting information regarding the usefulness of the Canadian Section of the Institute, in the commercial interests of the Dominion.

A selection of trade enquiries continues to be regularly supplied to certain newspapers and trade journals both in Canada and Great Britain; these have elicited a considerable number of replies, and in several cases have been the means of bringing buyers and sellers together. An advantage of the system is that it permits of constant additions to one's knowledge of houses interested in particular lines of goods, and in the case of Canada it shows which special houses out of a number known to be producers of certain goods are desirous of taking up export trade.

There have been the customary enquiries for the names of Canadian shippers and producers of goods now in staple demand, and applications for information from Canada have included several new subjects.

In the Colonial Sections of the Exhibition held at Glasgow last year, the Canadian exhibit constituted one of the most important and attractive features. It has already been stated that the unrivalled collection illustrating Canada's mineral wealth was transferred to the Royal Exchange for public exhibition, and was removed thence, last May, to the North Gallery of the Institute, where it constitutes the most important portion of the special Colonial Exhibit.

SUPPLY OF COLLECTIONS.

Applications continue to be constantly received from public Institutions and Schools for specimens of natural products from the Colonies and India for educational purposes, or as contributions to exhibitions. During last year more than 5,000 specimens were, in consequence, distributed among over 80 different schools. Moreover, a collection of 220 samples of agricultural produce from the Colonies has been supplied to the Department of Agriculture and Technical Instruction for Ireland, as additions to the Science and Art Museum, Dublin. Samples of Indian products have also been supplied to that Museum and to other public Institutions.

A special collection has been supplied to the Cheltenham Grammar School, and a collection of Colonial specimens of various kinds has been contributed to a Naval and Military Exhibition which is being held at Portsmouth.

A large number of exhibits were temporarily removed from the Queensland and Rhodesian Collections early last year for the purposes of the Glasgow Exhibition, and the British North Borneo exhibits were lent for the Royal Exchange.

PUBLIC LECTURES AND DEMONSTRATIONS.

The series of Lectures open to the public during the Winter Seasons of 1901-2 have certainly not been inferior, in interest and importance in regard to the information they conveyed concerning various parts of the Empire from specially authoritative sources, to those of preceding Seasons, as will be seen from the following list of subjects and lecturers:—

1901.—January-March: "The Decay of China," "China and Japan Contrasted," and "European Interests in China," by Ian C. Hannah, Esq.; "New Brunswick," and "The Maritime Provinces of Canada," by W. A. Hickman, Esq., B.Sc.; "Jamaica, the Isle of Springs," by T. H. Wardleworth, Esq., F.L.S.; "The West Indies and their Attractions," by W. R. H. Trowbridge, Esq.; "The Locust Plague and its Suppression," by A. Monro, Esq., M.D.; "Canada and the Empire," by the Right Hon. Lord Strathcona and Mount Royal, G.C.M.G. (The Duke of Argyll in the chair).

October-December: "New Zealand," by the Rev. Joseph Berry; "Jamaica," by H. T. Thomas, Esq.; "Facts and Fancies about Canada," by J. W. Bengough, Esq.; "The Brown Coal-beds of Victoria," by J. Stirling, Esq.; "Western Australia," by the Agent-General for Western Australia (the Hon. H. B. Lefroy); "Planters and Planting in Tropical Greater Britain," by R. Hedger Wallace, Esq.; "The Maroons of Jamaica," by H. T. Thomas, Esq.; "The Economic Resources of the Straits Settlements and of the Malay Peninsula," by H. N. Ridley, Esq., M.A.

1902.—January-March: "Federal Fulfilment," by the Hon. Sir John A. Cockburn, K.C.M.G.; "The Native Races of Nigeria," by C. F. Harford-Battersby, Esq., M.D.; "The Coloured Races in Australia," by the Hon. Sir Horace Tozer, K.C.M.G. (Agent-General for Queensland); "The Obstacles to Development in West Africa," by C. F. Harford-Battersby, Esq., M.D.; "British Columbia," by the Hon. J. H. Turner, (Agent-General for British Columbia); "New Zealand, Her Record and Destiny," by Edward Wakefield, Esq.; "The Condition of the People of India," by J. D. Rees, Esq.; "Home Life in Canada," by H. Greenwood, Esq.; "Nova Scotia," by John Howard, Esq. (Agent-General for Nova Scotia).

In addition to the Lectures, a new departure was made in utilizing the unrivalled Collections of the Institute, representing the resources of the various Colonies and India, for direct instruction purposes. In compliance with an application from the Principal of

University College School, Mr. R. Hedger Wallace was allowed to meet the pupils on fixed days and hours in certain of the Colonial Courts, and deliver brief discourses to them on the natural resources of the particular Colonies, illustrating his subjects by reference to the specimens of products exhibited. The success attending these demonstrations induced the Council of the Institute to engage Mr. Hedger Wallace to deliver a series of brief afternoon public discourses of the same character at the Institute, the audience afterwards adjourning with the instructor to the Court of the particular Colonies dealt with by him, where the characteristics, etc., of the exhibited products were indicated and explained.

It is well worthy of consideration whether, in future arrangements at the Institute, this very instructive practical utilization of the Collections may not be advantageously extended.

THE COMMERCIAL INTELLIGENCE DEPARTMENT,

which was established in 1888, within a year after the foundation of the Institute, and directly after the grant of its Royal Charter of Incorporation, continues to supply information of the most varied kind, commercial, technical and general, with special reference to emigration; and the calls upon it for replies to enquiries from all classes of the public have steadily increased in number, diversity and importance, since the foundation of a precisely similar office by the Commercial Intelligence Department of the Board of Trade nearly three years ago.

The majority of applications received are for information for intending emigrants, and ordinary trade enquiries for names of firms, etc., or for information as to Colonial products. But the following are illustrations of enquiries of a special character, which have been selected to show the variety of information applied for. In addition, it may be stated that a large number of personal applications are made for the opportunity of referring to official publications, British and Foreign Consular reports, Colonial and Foreign trade directories, trade circulars, prices current, etc. :—

Government of Seychelles.—Information as to modern methods and processes employed in the manufacture of fish oils.

H. C., Tasmania.—The curing and preparation of anchovies, as practised in Norway.

Admiralty.—The properties and value of "Yacal" wood, a timber obtained in the Philippine Islands.

T. M., Berkshire.—Lucerne or alfalfa; methods of cultivation, uses of the crop, etc.

Board of Trade, London.—Particulars of companies or firms manufacturing peat-fuel in Great Britain.

G. & Co., Malta.—Names of merchants in Australia for the sale of Maltese lace.

T. & Co., London.—Cultivation of pimento in Jamaica.

Board of Trade, London.—Sources, in England, of stone such as is used as "hearthstone."

P. & Co., London.—Commercial sources of manioc flour, with names of firms exporting the product.

Agent-General for Queensland.—Commercial value in England of a brand of concentrated milk, with information as to its prospects of finding a market.

W. W., London.—Agricultural exports of Argentina.

R. & Co., Wolverhampton.—Weights and measures in Hayti and Cuba.

R. E. & W., Liverpool.—Exporters of molybdenite in Australia.

E. B., Rio de Janeiro.—Methods of preparing "banana flour."

C. H. A., London.—Sample of Niin oil from Mexico required and obtained.

G. C. W., London.—Dita (or Dika) fat from West Africa. Samples and particulars as to possibility of commercial supplies.

A. B., London.—Cultivation of the lemon; and the lemon oil industry in the West Indies and other Colonies.

MAP AND CHART ROOM.

The collection of maps in the Map Room of the Commercial Intelligence Department has been regularly augmented with new editions and with the publications of the Admiralty, the Ordnance Survey and the Intelligence Division of the War Office. The Colonial and Indian Governments also constantly renew and add to the collection of maps.

THE CITY BRANCH.

The Branch Office at Cannon-street, which, since June, 1899, the Institute has had in the premises occupied by the British Empire League, while it afforded good accommodation for a Reading Room and Enquiry Office, did not meet two important requirements, viz., office facilities for the transaction of business with brokers, merchants, etc., in the City by Curators of different sections of the Colonial Collections at South Kensington, or by commercial agents appointed by particular Colonies; and sufficient space, with the necessary arrangements for the exhibition, from time to time, to business men, of samples of Colonial or Indian products, natural or manufactured, which it is desired to place upon the market.

The Government Authorities of the Dominion and Provinces of Canada, and prominent Associations of Canadian manufacturers, have for some time past realised that it would be in the interests of trade with that Colony if special facilities were available in the above directions, and the Dominion Minister of Agriculture, the Hon. Sydney Fisher, during a visit which he paid to London last year, discussed this matter with the Honorary Director of the Institute, the result being that, provided the latter were successful in securing premises in a sufficiently central locality in the City, affording the necessary accommodation for the purposes specified, the Dominion Government would pay a contribution, per annum, towards the cost of acquiring and maintaining them. After somewhat protracted negotiations, the "Commercial Intelligence Bureau, Limited" (a Syndicate operating upon the lines of the Philadelphia Museum, described in the *IMPERIAL INSTITUTE JOURNAL*), agreed to let to the Institute a portion of extensive premises occupied by them in Eastcheap, sufficient to furnish a commodious sample room, a Commercial News room, and Offices for Colonial Commercial Representatives, and the Dominion Government has paid a contribution towards the rent of this Office for a period of one year.

This new City Branch of the Institute was opened on the 1st May last, and has already been turned to useful account; special samples of products from Seychelles, from South Australia and East Africa have been on view there, and, in addition to the arrangement made with Canada, the India Office has arranged for the regular attendance of a qualified Commercial Agent, while a similar Official appointed by New South Wales has just completed arrangements for his establishment there.

It may be stated that the Authorities of the Board of Trade are strongly impressed with the importance of considerably developing this City Branch of the Institute in the interests of the Colonies.

THE FUTURE OF THE IMPERIAL INSTITUTE.

The relations of the Board of Trade Information Office with that of the Institute have continued to be very cordial, and the older Office, as well as the Scientific and Technical Department, has been applied to from time to time by the Government Information Office for assistance in dealing with enquiries of a specially technical character (*see illustrations included in the "examples of subjects dealt with in the Intelligence Department"*).

But the fact that the Board of Trade had established and were proceeding actively to develop a Department destined to carry on work of identical character with that of the Commercial Information Department of the Institute, by means of perfectly analogous arrangements, led, on the part of those directing the affairs of the Institute, to a serious consideration of the question whether, in place of facing, in the continuance of some of its most important operations, direct competition with one of the most important Departments of H.M. Government (the Board of Trade), it would not be wise to contemplate the union and consolidation of two establishments having precisely the same objects in view, viz., the development of the resources and advancement of commercial and industrial interests of the various countries composing the British Empire.

The subject having received very careful consideration on the part of Lord James of Hereford, Chairman of the Governing Body, and Sir Frederick Abel, the Director of the Institute, an outline scheme was prepared, which met with the cordial approval of His Majesty the King (and which was ascertained by Lord James to be favourably entertained by H.M. Government) for the transfer by the Governing Body of the Imperial Institute to the Representatives of the Nation—the Government—the West Section of the Main Building, the Galleries, Collections, furniture, and all funded and other property appertaining to the Imperial Institute, on the condition that this property be strictly applied to carrying out the objects for which the Institute was founded, and which are specified in the Royal Charter of Incorporation granted to it by Her late Majesty Queen Victoria.

The President of the Institute, the Prince of Wales, consequently authorised the summoning of a Special Meeting of the Governing Body of the Institute, which was held at York House on the 21st December, 1901. His Royal Highness presided at this Meeting, when, after the delivery of an address by Lord James of Hereford, explanatory of the proposals which the Governors were called upon to consider, it was unanimously resolved that "this Meeting of the Governing Body of the Imperial Institute, believing that its objects and purposes will be best carried out by the Institute and its property being transferred to the Nation, hereby approves of such transfer." A Committee was thereupon appointed, with power to add to its number, "for the purpose of carrying the Resolution into effect." His Royal Highness the President, at the conclusion of the business, expressed his satisfaction at the decision of the Governors, and stated that "the King entirely approved of the course to be adopted." (The proceedings of this Meeting were published *in extenso* in the *IMPERIAL INSTITUTE JOURNAL* for February, 1902, Vol. VIII, p. 37).

The Law Officers of the Crown having decided that the proper course to be pursued for effecting the proposed transfer, was by presenting a private Bill to Parliament, the necessary steps were taken by Lord James of Hereford, in consultation with the President and Secretary of the Board of Trade, and Sir Frederick Abel, for the preparation of a draft Bill, the terms of which were afterwards considered and agreed upon by the Special Committee of the Institute's Governing Body, the members of which were: Lord James of Hereford, Sir Henry Fowler, the Lord Chief Justice, the Lord Chancellor, the Hon. Sir Robert Herbert, Sir Owen Tudor Burne, and Sir Frederick Abel; and also Lord Strathcona and Mount Royal (representing the Dominion of Canada), the Hon. Henry Copeland (representing the Commonwealth of Australia), the Hon. W. Pember Reeves (representing New Zealand), and the Hon. Sir Walter Peace (representing the South African Colonies).

In the preparation of the Bill, great care was taken to completely protect the interests of the Colonies and India in the Institute, to secure the best efforts of the Government towards the attainment of its objects and purposes as laid down in the Charter of the Institute, and to secure, as far as practicable, to the Life Fellows of the Institute, privileges of the same kind as those hitherto attaching to that office.

To further this result, the Bill provided for the appointment of a Committee to act as an advisory body to the Board of Trade. This Committee was to consist of two leading Officials of the Board of Trade, and four eminent Representatives of Commerce and Industries to act with them as representing that Board; it was also to include Representatives of the Dominion of Canada, the Commonwealth of Australia, the Government of New Zealand, the Governments of South African Colonies, the Crown Colonies, and the following Government Departments other than the Board of Trade, viz., the Colonial Office, the Foreign Office, the India Office, and the Board of Agriculture, to be severally appointed by the Heads of those Departments.

In passing through the House of Lords, "the Imperial Institute Bill" received, by agreement between Lord James of Hereford, and Lord Davey as representing the University of London, two small amendments, designed to protect the interests of the University in connection with the recent transfer to that Body of certain portions of the Institute Buildings. The Bill passed through the House of Commons without amendment, having been read for the third time on July 14, 1902, since when it has received the Royal assent.

Consequent upon the Imperial Institute Act having become law, the authority and offices of the Governing Body and officials of the Institute will cease on the 31st December 1902, the transfer of the Institute, its property and government to the Board of Trade taking place on January 1, 1903. The Act does not provide for the continuance of the existence of ordinary or annually paying Fellows of the Institute; they will, therefore, no longer exist after the 31st December, 1902.

The Governing Body of the Imperial Institute have every reason to hope and believe that, in becoming a Branch of the Government Department whose special functions are the promotion and continuous development of the commercial and industrial interests of the Empire, the Imperial Institute will be placed in the best position for fulfilling the objects of its foundation, as a fitting Memorial of the Reign of Her late Majesty QUEEN VICTORIA.

July, 1902.

F. A. ABEL.

New Automobile Fire-Engine.—With reference to the self-propelling steam fire-engine mentioned in last month's issue of this *JOURNAL* (p. 181), we are informed that this engine has been designed by the old-established firm of Merryweather and Sons Limited, of Greenwich-road, London, by whom it is being manufactured. At present a number of these engines are in course of construction, but they are all for foreign or colonial purchasers. The engine would appear to be well adapted for use in some of our large cities in place of the present cumbersome horse-drawn machine.

New Patent Steam Exhaust Head.—A new steam exhaust head (Fletcher's patent) has been produced by the Frictionless Engine Packing Company Limited, which presents some new features. It claims to prevent the ejection of water, to reduce the noise of the exhaust, to save oil or grease, and to prevent damage to property, having no back pressure. The oil is recovered and, after filtration, can be used again. Dry steam only is discharged into the atmosphere, and its discharge is practically noiseless. The steam is also freed from its unpleasant greasy odour. The head is designed on entirely novel lines. The steam from the exhaust pipe, entering the head at the bottom, draws cold air with it from outside the head, by a kind of injector action; and this cold air, mixing with the steam, cools the grease and condenses the wettest of the steam, making the separation of the oil and water possible without the complicated baffles and crooked passages usual in this class of apparatus. The area for the passage of steam through the head is at every part from three to six times that of the exhaust pipe, and when it is remembered that a part of the steam is condensed, and that the head is open to the atmosphere, both top and bottom, it will easily be seen that it is impossible for the head to set up back pressure. These heads are at work, and are equally effective on the exhaust of old single cylinder, high-pressure engines, and the most modern high speed engines running at 500 revolutions per minute.

FINANCIAL AND COMMERCIAL RETROSPECT.

UNITED KINGDOM.—The returns of our foreign trade for June are not unsatisfactory, when it is remembered that two working days were rendered useless by the holidays appointed for the Coronation, which, in itself, doubtless exercised a slackening effect on many businesses. The imports, valued at £40,665,315, showed a decrease of £1,045,723, or 2·5 per cent., which was spread over most classes of articles, except duty-free articles of food and drink, tobacco, manufactured articles, and miscellaneous articles. There was a decrease in the quantity, accompanied by a rather less than proportional decrease in the value, of cattle, sheep and lambs, bacon and fresh beef; on the other hand, preserved meat (not salted) increased 80·7 per cent. in quantity and 56·7 per cent. in value; while mutton improved 45·5 per cent. in the former respect and 54·3 in the latter, larger amounts being shipped by Holland, Argentina, and New Zealand. Butter, worth £1,649,502, was 3·8 per cent. better in amount and 2·8 per cent. in value; in cheese the increase in quantity was 16·9 per cent., but there was a fractional falling-off in value; while eggs, worth £585,693, advanced 22·9 and 27·2 per cent. in the quantity and value respectively. In cereals, the only increase was in wheat, which rose 40·5 per cent. in value, to £2,850,924, the quantity increasing by 39·1 per cent., owing to larger arrivals from Russia, Roumania, the Pacific Coast of the United States, Argentina, India, Australia, and Canada. The diminution in the quantities and values of other cereals were, in wheat flour, 32·3 and 30·3 per cent.; in barley, 14·7 and 9·6 per cent.; in oats, 45·9 and 32·0 per cent.; and in Indian corn 26·4 and 18·2 per cent. The decline in the quantity of Indian corn sent by the United States is particularly remarkable; in June last it was only 13,273 cwt., against 1,883,200 cwt. in the same month of last year, while in the first half of 1901 we received 20,653,400 cwt. from the United States, but only 1,005,636 cwt. in the same period of the present year. In raw sugar there was the large increase of 284,786 cwt. (50·2 per cent.) in quantity and £62,109 (30·4 per cent.) in value, but the refined article fell off by 14·2 per cent. to 910,268 cwt., the value declining 29·5 per cent. to £485,214. There was a large movement in unmanufactured tobacco, the quantity of which was greater by 143·0 per cent., though lower prices limited the rise in value to 88·6 per cent. The value of sawn and hewn wood declined by 15·5 per cent. to £2,353,020, but the decrease in quantity was somewhat less. Raw cotton fell off by 29·5 per cent. in amount and 27·7 per cent. in value, owing to smaller shipments from the United States. In sheep's wool there was a decline in quantity of 23·8 per cent. and in value of 22·1 per cent., for although larger consignments were received from British South Africa, India, and New Zealand, those from Australia and South Africa were smaller. In the exports of British and Irish produce, which were valued at £21,252,383, there was a decrease of £1,192,041, or 5·3 per cent., which was spread over all classes of articles, except apparel and articles of personal use. Coal, though fractionally greater in quantity, was worth £307,512 less. Iron and steel also fell off by 0·2 per cent. in quantity and 2·0 per cent. in value, while the value of machinery and millwork was less by 3·8 per cent.; the value of new ships sold to foreigners was also less. In yarns and textiles smaller shipments of cotton yarn to India had the effect of reducing its quantity by 11·2 per cent. and its value by 9·3 per cent. Cotton piece-goods declined 7·2 per cent. in quantity (30,806,600 yards) and in value by 8·2 per cent. (£364,361); the exports were higher to China, Japan, Brazil, and British South Africa, but there was a large decrease in those to India, Bombay taking only 37,895,000 yards, against 81,910,000 in June of last year. Other cotton manufactures were worth 9·0 per cent. more. In woollen and worsted yarn there was an improvement of 5·1 per cent. in quantity and 8·6 per cent. in value. In chemical manures there was a considerable fall in prices, and the exports, though only 0·3 per cent. less in quantity, were 12·5 less in value; soda compounds, however, increased 13·2 per cent. in the former and 5·5 per cent. in the latter. The re-exports of foreign and colonial merchandise were valued at £5,609,128, against £5,522,270 in June of last year, there thus being an increase of £86,858. For the first half of the present year the total of the imports was 0·1 per cent. higher than in the same period of last year, but that of the exports of British and Irish produce was 2·3 per cent. less.

According to the recently published returns of navigation and shipping in the United Kingdom for 1901, the total number of British vessels entered at ports in the United Kingdom was 315,056, with a net tonnage of 83,800,000; in the previous year the number was 316,816, and the tonnage 84,195,000. The number of British vessels cleared in the same year was 310,537 (tonnage 82,878,000), against 311,875 (tonnage, 82,917,000) in the preceding year. The total number of vessels built in the United Kingdom, exclusive of those for the Navy and for foreigners, was 1,204, the net tonnage being 775,681. In the year before the number was 1,171, and the tonnage 736,906.

The loan of £1,000,000 Three per cent. Stock recently offered in London by the Victorian Government appears to have been a failure, at least so far as the public is concerned, for the underwriters are understood to have been left with 95 per cent. of the total, since only about £50,000 was subscribed. The unhappy fate of this issue has led to a loan of £751,000 projected by British Colombia being withdrawn from the underwriters.

COLONIES.—In the last financial year the receipts of the Australian Commonwealth amounted to £11,304,800, of which £8,908,300 came from Customs and Excise, £2,378,700 was from postal receipts, and £17,800 was from sundries. The expenditure having been £3,931,300, a sum of £7,373,500 was left for distribution among the States, being £519,000 more than was expected. In Western Australia the revenue for the financial year ending June 30, rose to £3,688,048 against £3,078,033 in the preceding

year. Of these totals, the State contributed £2,129,047, as compared with £1,875,691 in the previous year, and the Commonwealth £1,559,001, compared with £1,202,342. In Queensland the Treasury returns showed a revenue of £3,535,000 for the year, and an expenditure of £3,967,000; both these sums are less than in the preceding year, the former by £561,300, and the latter by £657,500. According to the financial statement of the Acting Colonial Treasurer, last year's revenue in New Zealand amounted to £6,152,839, and the expenditure to £5,914,915. There was thus a balance of £237,924; this, added to the balance of £32,564 brought over from the preceding year, gives a total surplus of £270,488. For the current year the expenditure is estimated at £5,987,063, and the revenue at £6,083,500; the surplus of £96,437, added to the £270,488 brought forward from the present year, gives a surplus of £367,000, available for supplementary estimates or for transfer to the Public Works Fund. The latter had a cash balance of £454,059 at the end of the year, excluding some £100,000 of the last loan which has yet to come in. There is an intention of raising a new loan of 1½ millions sterling, to be spent in the construction of railway lines, and the provision of new bridges and stock. The gross public debt now amounts to £52,900,000, the increase during the last financial year having been £3,370,000. The financial statement of the Dominion of Canada for the year ending June 30 last shows that the revenue amounted to \$56,303,694, or 5½ million dollars more than in the preceding year. The total surplus over expenditure is expected to reach the sum of seven million dollars, or a million more than was anticipated by Mr. Fielding in the Budget speech. The imports for the year were valued at \$202,791,595, and the exports at \$211,725,563, the increase in the former case being 21 million dollars, and in the latter 15 millions. The Customs revenue was \$32,500,000, or 3½ millions more than in the preceding year. About three million dollars were added to the public debt in the year. In Newfoundland, too, an excellent account is given of the financial situation, the revenue for the fiscal year ending on June 30, amounting to nearly \$2,200,000, which is \$100,000 more than in the previous year, and the largest recorded in the history of the colony. The gold output of the Transvaal mines is slowly increasing. For June it amounted to 142,780 oz. of fine gold, against 138,602 oz. in May. There can be little doubt, however, that some trouble is being found in getting a sufficient supply of labour. The Stock Exchange at any rate finds it convenient to believe that this is the case, in spite of reassuring telegrams from the Transvaal Chamber of Mines which assert that there are no special reasons for anxiety on the point. The Rhodesian output for June was 15,842 oz., which is greater than the yield in June of last year (14,863 oz.), but considerably less than that in May last (19,597 oz.). In Victoria the yield for June was 78,954 oz., or 11,164 oz. more than in the same month of last year. In Queensland the amount was 68,800 oz. In Western Australia, 157,236 tons of ore yielded 173,185 oz. of gold; in June of last year 150,688 oz. were obtained from 134,369 tons of ore.

The following table shows the variations which have occurred during the last three months in the prices of certain Colonial Government Securities:—

	28th May.	30th June.	29th July.
Canada 3 per cent. . . .	103½-104	102-102½	102½-103½
Cape 3 per cent. . . .	98-98½	97½-97¾	94½-94¾
Natal 3 per cent. . . .	96½-97½	97-97½	95½-97
New S. Wales 3 per cent. . .	95-95½	95¼-95¾	94½-94¾
New Zealand 3 per cent. . .	95½-96	96-96½	96-96½
Queensland, 3 per cent. . .	95¼-96¼	94½-95	93½-94
South Australia 3 per cent. .	96-96½	95¼-95¾	94½-94¾
Tasmania 3½ per cent. . .	104½-105½	103½-104½	103½-104
Victoria 3 per cent. . . .	98½-98¾	97½-97¾	94½-95½
West Australia 3 per cent. (May-Nov.)	94½-95½	94¾-95¼	94-95

INDIA.—According to the annual review of Mr. J. E. O'Connor, the Director-General of Statistics to the Government of India, the imports into India in 1901-2 were better by £5,000,000 than in 1900-1, while the exports increased in value by £11,000,000. The following table shows the total trade for four years in millions of pounds sterling, the rupee being taken at 1s. 4d.:—

	1901-2.	1900-1.	1899-1900.	1898-9.
Imports of merchandise . . .	59·16	53·93	50·21	48·07
Imports of treasure (net) . .	6·27	6·90	8·67	6·99
Exports of Indian merchandise	80·84	69·68	70·55	72·95
Exports of Foreign merchandise	2·17	2·14	2·19	2·25

Of the imports, the most important were, of course, cotton-goods, which accounted for 40 per cent. of India's total imported merchandise, and for one-third of Lancashire's exported cotton. Their total value in 1901-02—nearly 22 million sterling—was slightly above the average of the last five years. The next imports in order of magnitude were metals and metal manufactures, which made up 15 per cent. of the whole and represented a value of £8,769,000. Here Belgian competition is making itself felt; in 1900-01, the imports of steel bars, girders, plates, etc., from Belgium and the United Kingdom were both of about the value of £330,000, in 1901-02 the Belgian share rose to £616,580, while the British are scarcely increased at all. Of refined sugar the total imports rose from 4,842,000 cwt. in 1900-01 to 5,429,000 cwt. in 1901-02, but the noteworthy point is the increase in the import of bounty-fed sugar, which was 1,740,000 cwt. in 1900-01 and 2,850,000 cwt. in 1901-1902, Austria-Hungary sending 1,321,000 cwt. in the former year and 2,258,000 cwt. in the latter. The export list was for the first time headed by oil-seeds, with a value of £11,186,000; of these, France was the best purchaser, followed in order by the United Kingdom, Germany, and Belgium. Of jute, 14,755,000 cwt. were exported, which is the more remarkable when the increased requirements of the Indian mills are taken into account. Raw cotton, which declined heavily in 1900-01, rose to 5,700,000 cwt. as a result of larger crops; Japan took 44 per cent. of it, and China 10, the residue mostly going to Germany and Italy. Opium declined considerably and so did indigo. The area devoted to the cultivation of the latter in Bengal was 39 per cent. below the average of the previous five years, but the main factor in the diminution is doubtless to be sought in

the competition of the artificial product. Indian planters can no longer raise the price by withholding the dye when the market is weak, for the artificial article is always there to supply the demand, and there is a constant tendency towards lower prices. Tea to the amount of 180,000,000 lb. was exported—a reduction of more than 10,000,000 lb.—and values fell still more. As to coal, the amount sent away was slightly less than in the preceding year; two-thirds of it went to Ceylon, and most of the remainder to Aden and Singapore.

The following table shows the variations which have occurred in the prices of certain Indian railway securities, during the past three months:—

	29th May.	30th June.	30th July.
Bengal and North Western	130-134	129-133	128-132
Bengal-Nagpur Gua. 4 per cent.	105-109	105-109	105-109
Bombay, Baroda & Cent. India	160-164	158-162	154-158
Indian Midland 4 per cent.	105-109	104-108*	105-109
Madras Grntd. 5 per cent.	135-139	137-141	134-139
South Indian 4½ per cent. Deb.	138-143	137-141	137-141
Southern Mahratta 3½ per cent.	106-109	105-108*	104-107

* Ex. div.

FOREIGN COUNTRIES.—An important item of news arrived from China towards the end of the month, when it was announced that Imperial sanction was given on the 21st to the scheme proposed by Sir J. L. Mackay for the abolition of *likin* stations in return for increased import and export duties. Publication of the details of the scheme was, however, deferred.

Our usual table of exchanges follows:—

	28th May.	28th June.	29th July.
Paris, cheques	25f. 21c.	25f. 17c.	25f. 16c.
Berlin, sight	20m. 49pf.	20m. 46½pf.	20m. 48pf.
Vienna, sight	24kr. 3h.	24kr. 1h.	23kr. 96½h.
Amsterdam, sight	12fl. 14¼	12fl. 14¼	12fl. 12½
Madrid, sight	34ps. 65	34ps. 40	34ps. 40
Lisbon, sight	41½d.	42½d.	41½d.
St. Petersburg, 3 months	94r. 20	94r. 10	94r. 10
Bombay, T.T.	1s. 3¾d.	1s. 3¾d.	1s. 3½d.
Calcutta, T.T.	1s. 3¾d.	1s. 3½d.	1s. 3½d.
Hong Kong, T.T.	1s. 8¼d.	1s. 8¼d.	1s. 8¼d.
Shanghai, T.T.	2s. 3¾d.	2s. 3¾d.	2s. 3¾d.

AGRICULTURAL RETROSPECT.

UNITED KINGDOM.—The weather of July was, on the whole, favourable to farmers, and brilliant spells of sunshine of sufficient duration enabled them to secure the greater part of their hay crops in splendid condition. The late-sown root crops made their appearance under acceptable conditions of weather, and by the middle of the month, cereal crops, particularly wheat, were ripening rapidly, but the cold and wet weather of the latter end of the month will have the effect of retarding the wheat harvest considerably, so that hardly an acre of wheat will be cut, even in the most favoured districts, before the end of the first week of August. The results of a long series of investigations on the ripening of cream, carried out at the Storrs Agricultural Experiment Station, New England, U.S.A., although they do not furnish an adequate explanation of the causes of the delicious flavour of June butter, seem, nevertheless, to throw upon the subject more light than has hitherto been forthcoming. Previous experiments had been restricted chiefly to efforts to separate from milk or cream different species of bacteria, and then, by inoculating Pasteurized cream with pure species of the isolated organisms, to determine the influence that each species, if acting alone, might exercise upon the cream. These investigations have resulted in demonstrating that different milk bacteria vary decidedly in their influence upon the character of butter. Hitherto there has been a lack of information concerning the exact bacteriological condition of normal cream before it is ripened, or the change in bacteriological content that occurs during ripening. The object of these experiments has been to determine, as far as possible, the types of bacteria which produce the ripening of cream under normal conditions. Without entering upon a detailed account of the experiments which Messrs. Conn and Esten undertook, it may be useful to glance at the conclusions they arrived at. It is stated at the outset that milk as it is drawn from the cow contains great numbers of bacteria, which are mostly miscellaneous forms of liquefying bacteria—that is, organisms which possess the power of liquefying gelatine contained in the nutritive medium—and other non-acid species. The number of acid bacteria at the beginning is very small. All species of bacteria increase during the setting of milk for the separation of the cream. For a few hours the alkaline bacteria and the others included under the head of miscellaneous, increase quite rapidly, whilst the lactic bacteria are hardly in evidence. After about 12 hours, however, the lactic bacteria have increased so much that they are as plentiful as the others, and from this time on they continue to increase with great rapidity, until a *maximum* is reached at about 48 hours; after this they gradually diminish in numbers and eventually they practically disappear. The ripened cream contains prodigious numbers of bacteria, more than are known in any other natural medium, but they are nearly all lactic bacteria. After the first 12 hours all species of bacteria, except the two lactic species, decrease in relative numbers, and finally entirely disappear. The two common species, known as Nos. 206 and 202, increase regularly from the beginning of an experiment until the *maximum*. The cream as it is received by a creamery is already partly ripened, as indicated by the immense numbers of bacteria it contains. All the changes which

take place in the cream under the influence of the miscellaneous bacteria have already occurred, and the ripening that goes on in the creamery is due wholly, or almost wholly, to the growth of the acid bacteria. A ripened cream is almost a pure culture of acid bacteria, but this does not mean that the ripening has been produced by these acid bacteria alone. In other words, that the lactic bacteria play an important part in the ripening is perfectly evident, but that they are the sole cause of the changes occurring in the ripening is not so evident. The peculiar flavour of June butter, so much desired by the butter-maker, is not due to the development of the common lactic bacteria. Butter ripened during the winter months develops the two species of lactic bacteria as abundantly and as quickly as does that ripened in June, but the flavour does not declare itself. To what this June flavour is due the New England experimenters, after investigations extending over three years, are not yet satisfied. Whether it will prove to be due to the large growth of miscellaneous bacteria during the first few hours of ripening, or to a difference in the chemical nature of the cream, remains for further experiments to decide. This much, however, appears to be established—that the ripening of cream must embrace two phases. The earlier one comprises the first 12 hours or more of ripening due to the growth of miscellaneous bacteria; the latter begins after 12 hours and is due almost wholly to the growth of lactic bacteria. The results of further investigations at the Storrs station will be anxiously awaited—the problem involved being of the highest technical and commercial interest.

COLONIES.—It is reported that in ONTARIO crop prospects never looked better. This applies, also, to the small fruit and apple crops. Ontario produces a remarkably fine quality of apple, the result of many years' careful and intelligent study on the part of the farmer, aided and encouraged by the agricultural colleges. A full wheat and apple crop there means a handsome revenue to agriculturists. There is also every prospect of a large hay crop. The latest advices as to MANITOBA and the NORTH-WEST TERRITORIES are that everything is looking well, and a large crop of all kinds of grain, equal to, if not exceeding that of last year, may be expected. A report on BERMUDA recently issued by the Colonial Office, states that the cultivation and manufacture of arrowroot, which were at one time important industries in that colony, have, from various causes, greatly declined in recent years. The arrowroot produced in the colony by the latest improved methods is of an excellent quality, and there is a good opening for investment of a limited capital in this industry. In the few attempts made in flax-growing in some of the cooler parts of NEW SOUTH WALES, the results, so far as concerned the growth of the plants, have been very encouraging. The New South Wales Department of Agriculture has, for a long time, recommended the culture of this crop for the sake of the linseed, for which, as the dairy industry expands, there is an ever-increasing demand. In VICTORIA, where the facilities for the successful production of flax are no greater than is possessed in New South Wales, this crop has received considerable attention, and the industry, among farmers' subsidiaries, is rapidly attaining an important place. Mr. Hermann Wolff, of Traralgon, Victoria, in an article in the *Melbourne Leader*, has given a most instructive account of his experience in flax production, and affirms that flax-growing ought to become one of the principal rural industries of such States as Victoria, New South Wales, South Australia, and Tasmania. The two industries, dairying and flax-cultivation, are dependent on each other, inasmuch as the linseed is excellent feed for calves, and the oil cake is invaluable as feed for milch cows in the winter months. A later report from Victoria states that, next season, officers of the Department of Agriculture will visit all the districts of the State to instruct the farmers how to cultivate flax.

A report on the agricultural prospects of the plateaux of the UGANDA railway, by Mr. R. N. Lyne, Director of the Agricultural Department in Zanzibar, has been issued by the Foreign Office. From a settler's point of view, the most attractive country that the Uganda railway passes through is the Kikuyu country, a district 36 miles long by about 80 miles broad. The soil is a deep ferruginous loam. There is not much clay on the surface, but as one digs down a greater proportion of clay is met with. The Kikuyu country has an admirable water supply, being traversed by small streams. Settlement has already begun, and there are now 8 or 10 Europeans, besides the mission settlements, occupying and cultivating land. The staple crop is at present potatoes, two crops of which can be obtained in a year. European vegetables and fruit of all sorts, maize, millet and sorghum, grow and find a local sale. The product of the country is, as yet, probably undiscovered. In no part of the world do the conditions correspond to those of these equatorial highlands. A farmer from the eastern counties would probably describe the light red soil of the Kikuyu downs as a barley land. Barley likes just such a soil, and does not require a heavy rainfall. Mr. Lyne would recommend short straw varieties of oats for trial, and of wheats, he thinks South Australian varieties would be most likely to thrive in the dry atmosphere. Rye should certainly find a place in trials of cereals. Cotton (American), cinchona, cocaine, jalap, and cardamoms, are among the tropical products suited to these high altitudes, and tobacco to the low valleys. Coffee-planting has been fraught with so much disaster in other parts of the world that Mr. Lyne recommends great caution in embarking capital upon this industry in any part of British East Africa. It is at present impossible to say whether the Kikuyu has any great pastoral prospects. The Masai and Wakikuyu herd cattle, sheep and goats, and these form their principal articles of wealth and barter. The cattle are small, slow to mature, and give little milk; but they are hardy and docile. A shorthorn bull has been imported quite recently to cross with the native cows, and other breeds might be tried. Mr. Lyne suggests that experience might show that lighter cattle—like the Devon, Kerry, or Dexter-Kerry—would be more suitable to the light lands of the Kikuyu. The difficulties of market will, however, operate for some time against the profitable rearing of cattle on a large scale. With wool the case is different, as it is not a perishable product. The fat-tailed sheep of the country is the poorest

wool-producing sheep, its wool is extremely short in the staple, and so coarse that it would scarcely be classed as wool in this country. In Mr. Lyne's opinion the native sheep is not worth crossing, and new breeds should be introduced.

FOREIGN COUNTRIES.—The *Times* correspondent at St. Petersburg wrote recently on agricultural affairs in RUSSIA to the following effect:—"The well-known agricultural expert, Professor Lenz, has presented to the commission appointed to examine the condition of agriculture in Russia a report which has attracted considerable attention. After a detailed examination of the development of agriculture during the past ten years, Professor Lenz arrives at the most pessimistic conclusions. The irrational system of farming practised by the majority of the small holders can easily, he says, lead to the complete exhaustion of the soil. This exhaustion is not redressed by the use of the necessary manures. In fact, Russia would need some 11,000,000 head of cattle and some 18,000,000 horses more than she at present possesses in order to obtain fertilizing matter sufficient to redress the balance. The Russian farmers are living on their capital, in other words, on the fertile elements of the soil, to the extent of 725,000,000 roubles a year, a system of agriculture which must, sooner or later, lead to the exhaustion of the land, especially in the black earth zone. Another expert, however, Professor Pokrovsky, regards the apprehensions of Professor Lenz as exaggerated, and, in particular, he disputes the correctness of the figures upon which the latter bases his arguments. He none the less recognises the urgent necessity of propagating a more rational system of agriculture among the peasants. The attempts which are being made to develop the export of Russian meat to England have not escaped criticism. A writer in the *Russkiya Vedomosti* throws cold water on the whole movement. He points out that Russia has no meat to export, for the cattle raised in the country do not yield meat suitable for the English market. In this he is no doubt right. The verdict of all competent judges has always been that Russian meat will have to be very greatly improved if it is to have any chance of finding purchasers in England. He argues, moreover, that no development of the export trade is possible without the aid of protective devices of a more or less questionable character, and that any such development would be followed by an increase in the prices of meat in Russia itself. These prices have recently shown a marked upward tendency, and the writer in question thinks it would be exceedingly strange if the Government were to make sacrifices to encourage the export of products of which Russia has not a sufficiency for her own consumption. This last question is, of course, one which concerns the Russians alone. It would be different if, as the writer seems to fear, the Government were to seek to encourage the export of meat by some system of direct or indirect bounties. In view of the exorbitant duties which are imposed by Russia on British manufactures, and in justice to the meat-producing colonies, Great Britain could hardly encourage the import of bounty-fed meat from Russia.

Reports from Vienna state that the crop in HUNGARY, which is nearly ready, is the best for twenty years. Not only in quantity, but particularly in quality, the result is splendid. This applies to all cereals, especially wheat, rye, barley, and all sorts of fodder. The produce of wheat is estimated to exceed ninety million hundredweight. AUSTRIA is also expecting a good harvest.

LABOUR RETROSPECT.

UNITED KINGDOM.—On the 1st July the Welsh coal-miners gave six months' notice to terminate the sliding scale agreement. The suggested new agreement, which has been submitted to the employers, provides that a minimum wage rate for all colliery workmen shall be fixed at 40 per cent. above the standard wage rate of 1879, below which wages shall not be reduced; that a maximum rate for all colliery workmen shall be fixed at 70 per cent. above the standard wage rate of 1879, above which wages shall not be advanced, and that a Conciliation Board be formed, consisting of representatives of coalowners and workmen, with an independent chairman. Meanwhile reductions have come into operation under the various Boards regulating wages in other colliery districts. The appeal made by the National Association for the Employment of Reserve Soldiers with a view to ensuring occupation for the men who are returning from South Africa, is meeting with a good response. Nevertheless there will undoubtedly be some difficulty in finding work for these men, particularly in the provinces. Apart from the private firms, a number of county councils have promised to render what assistance they can. The London County Council proposes to engage discharged reservists as park constables at a salary of 27s. 6d. per week, with a uniform. London vestries will accept good conduct men as street orderlies at a salary of from 25s. to 30s. per week. Reservists who are of good physique, and who are able to swim a distance of fifty yards, are eligible for the police force at the various London docks, while the Birmingham police authorities recently offered to take men into the force up to the age of twenty-eight. The Commissioner of the City Police has been authorised to re-admit from time to time into the force the reservists who had been serving in South Africa. The situation in the cotton trade is worse, and an extension of the short time movement has been freely discussed. The Master Cotton Spinners' Federation asked those engaged in the trade to extend the short time movement for a further two months by stopping on Saturdays and Mondays, or, in lieu of stoppage, to contribute one-sixteenth of a penny per spindle for the benefit of those who did. The federation intimated that, unless eighty per cent. consented to do one thing or the other, then they would take no further action. That stipulated percentage had not been received, and the Committee resolved that, in the face of the circumstance, they were not warranted in recommending further short time. The whole question, however, will be re-opened.

COLONIES.—Wonderful progress is already being made in the settlement of our new SOUTH AFRICAN COLONIES, and every day it becomes more apparent what a poor chance of proper development these countries have had in the past, and what splendid results may be attained under a wise and progressive administration in the future. This applies particularly to the ORANGE RIVER COLONY, which is almost entirely an agricultural country. Some idea of the expansion that may be expected can be gathered from the fact that seven millions are to be expended as follows: £2,200,000 for railway extension, £1,800,000 for the payment of the railway debt to Cape Colony, £1,500,000 for the repatriation of Boer families, and £1,500,000 for land settlement. The first work has been in connection with the return of the burghers to their farms, every effort being made to facilitate their settling down again comfortably. The Government provided transport, temporary shelter, bedding, rations, and implements, tools and seeds necessary for starting farm operations. The no less important task of introducing and dealing with new settlers is, also being promptly and efficiently dealt with. Ex-irregulars are already being established in good numbers, the first group to take up land in the Ermelo district of the Orange River Colony, in which neighbourhood the Government has secured about 100,000 acres, being a party of New Zealanders.

In the TRANSVAAL, a scheme has been elaborated by the Land Board outlining the principles guiding the Government in the selection of settlers and allotment of holdings. The class of settlers specially desired are men of same farming experience with upwards of £300 capital. Married men with families are particularly wished for, and every facility will be given for the passage of their wives and families out to South Africa. Men without capital are not, however, excluded, particularly if they have colonial experience; such men, in fact, are being established on Government farms. The leading idea is that intending farmers should be settled in small colonies, numbering some twenty or thirty men each. The type of settlement will vary with the character of the district in which it is placed, the individual holdings consisting of irrigated land for tillage, mixed tillage and grazing ground, or larger allotments for grazing. An important feature is the establishment of model farms in the larger colonies, managed directly under the Government by salaried agents. From the foregoing it will be seen that it is the agriculturist with capital who is wanted in the new colonies, and too much stress cannot be laid upon the fact that the number of clerks and others of similar vocation is already sufficient to meet all present requirements. For competent mechanics, particularly those in the building trades, there is still a demand throughout our South African Colonies. Now that the mining industry is rapidly re-opening, the problem of obtaining a sufficiency of unskilled labour, such as has been sought in time past more or less successfully from native sources, is again causing anxiety. The difficulty is increased owing to this being the season when the natives return to their homes. It is stated that while the mines are anxiously waiting for 70,000 or 80,000 natives, the Native Labour Association is unable to secure more than 4,000 or 5,000 a month. It is clear that under present circumstances the chances of a permanent, reliable and adequate supply of unskilled labour at the mines are small, and the adoption of some system under which the services of white men could be utilized without arousing the prejudices which exist against giving whites and natives similar employment is being strongly advocated. There is nothing in the climatic conditions of the country to prevent a white man from performing unskilled manual labour, and the Chamber of Mines has lent a favourable ear to an appeal made by Lord Kitchener, and is offering work at the surface of the mines to ex-irregulars at 5s. a day and all found. An unlimited supply of white labour, enabling more work to be done and more stamps to be dropped, would be an enormous gain to the mines, and indirectly to the whole of South Africa. The *Times* makes some pertinent suggestions as to obtaining such a supply. It will readily be admitted that the British Isles are over-populated and that the withdrawal of 100,000 or more unskilled labourers would hardly be noticed, while the addition of this number to the new colonies would go a very long way to solve the South African problems. How can a stream of emigration on this scale be attracted to the country? In the first place, the mining companies must give the scheme full support, and allow the managers a free hand in carrying it out. The certainty of earning 5s. a day with board and lodging immediately on arrival in the country should in itself prove sufficient attraction. Already three-roomed cottages have been built for the men, six to be housed in each. The companies might undertake to apportion a cottage to each married man and family. Some big houses interested in land settlement schemes, as a further incentive to immigrants, might hold out the prospect of the acquisition of small plots of land on easy terms after a certain period, in which the labourer will be able to save a fair sum of money. The Government, on its part, being equally interested in promoting any scheme to attract British settlers to South Africa, might provide free transport. For many months to come transports will be plying between South Africa and England bringing home troops, and free passages could be given on the outward voyages to labourers and their families. Many mines are prepared to take any number of white men. If encouragement could be given to the experiment its success seems absolutely assured. Events prove that only a limited number of natives are available for labour in the country. Many thousands that might be liberated from the mines by an influx of white men would be available for employment elsewhere in railway construction and for agricultural purposes. Development in these directions will tend to the

cheapening of living, and so re-act on the prosperity of the country. The question is important, and demands immediate attention. If the London houses and big mining companies could arrange a *modus operandi* in conjunction with the Government, a great step would have been taken towards the settlement of the SOUTH AFRICAN problem.

In Gibraltar the usual mischief has been afoot between the trade unions and the employers' federation, the former demanding the right to nominate the men to be employed and to receive their pay for distribution after deduction of the union levies. There appears little cause for sympathising with the men unless it be on account of their ill-advisedness in resorting to strike methods where the influence of military discipline is so strong. Considerable hindrance was caused in the working of the port, and bluejackets and soldiers had to be requisitioned for the unloading of the ships. A settlement was arrived at by the 12th of the month, by which time over 1,000 men had accepted the employers' terms and registered their names as free labour workers. By the middle of the month work was proceeding smoothly again.

FOREIGN COUNTRIES.—As was forecasted in this column last month, the strike of miners in the anthracite districts of the UNITED STATES did not spread to the soft coal industry, all concerned recognising the unwisdom of a general stoppage. The National Convention of the United Mine Workers adopted the recommendation of their president that there should be an assessment of one dollar a week for all members of unions. According to the New York State Bureau of Labour Statistics the amount of idleness among the members of New York labour organizations in the first quarter of 1902 was far smaller than it has been in the months of January, February and March in any recent year. Heretofore, at least, 10 per cent. of trade unionists have been idle during these months, but this year the proportion has fallen to 6·2 per cent. Similarly the proportion of unionists at the end of the quarter was only 13·6 per cent. in 1902, as compared with 30·6 per cent. in 1897, and 18·3 per cent. in 1899, the best record hitherto for the end of March. While the improvement is fairly general, it is particularly noticeable in the building trades, which contain nearly one-third of all the members of the labour organisations in the State. In the clothing trade, too, the proportion of unemployed unionists was much smaller than usual, although it did not quite equal the remarkable record of 1899. While the proportion of union wage-earners who found some employment in January, February or March, increased very largely in comparison with other years, the duration of their employment averaged only a little better than in the corresponding months of the previous year. The average number of days worked by the men increased from 58 in 1897 to a little less than 67 in 1901, and 67·3 in 1902. Average earnings of organized working men increased in about the same ratio, having been \$155 in the first quarter of 1897, a little less than \$183 in 1901, and a little over \$184 in 1902. On the whole, therefore, the conditions of the labour market were better in the first three months of the present year than they have been in the corresponding period of any year since the depression of 1893.

The revival of the GERMAN industries during this spring, has not been permanent, as in the month of May a considerable decrease in the demand for labour set in, showing a more unfavourable condition than in May, 1901, in which the results of the industrial depression became first very keenly apparent. In some trades a direct decrease of employees has taken place, notably in the tailoring and hatters' business, in the brewing trade, several branches of the metal industry, in mining and smelting. The building trade in some German cities, as, for instance, in Hamburg, is in a favourable condition, while in Munich and Stuttgart the reverse is the case. In the textile industry the demand for labour has decreased. The general condition of the labour market has changed, especially unfavourably in the largest cities. In some an absolute decrease of employees has taken place, like Berlin, Munich and Dresden. Where an increase has occurred it is less than in the corresponding month of 1901, like Stuttgart, Leipzig, Frankfurt-on-the-Main and Strassburg. While in 1901 there were 145·1 applicants for each 100 vacancies, the number was 172 in May, 1902. The supply of male labour has increased to 224·3 for 100 vacancies, against 177·9 in May, 1901. The growing unfavourable condition of the labour market from one month to the other is so apparent that confidence that the crisis is over is shown to be unfounded.

SPAIN, where labour troubles are always present, has come fairly smoothly through a strike of agricultural labourers at Jerez, only to be confronted with an extensive agitation amongst the railway employees. The affair at Jerez, after some judicious persuasion on the part of the Alcade, terminated in the more reasonable of the labourers' requests being granted. It is gratifying to note that the Anarchist societies of the southern provinces have little influence on the agriculturists; it is to be hoped that a similar state of affairs will be found to exist in connection with the railway dispute.

Iron for America.—The recent shipments of iron from the Tees include a cargo of about 4,000 tons for Philadelphia. The fact is of importance for two reasons. At present the demand for pig iron for export feels the loss of the enquiry from Germany, which is one of the largest usually made on Teesside. And it shows also that there is a very full demand for pig iron in that country which is the largest producer, and which seems likely in the future to be our chief competitor. The sale to the United States shows that we need not fear competition from there in our markets for some time at least, and it helps us to take up the large production of pig iron that we have at present. We shall in some future time have to meet great competition; and if we can keep our stocks low, it will be a benefit to us when that time arrives.—*Newcastle Chronicle*.

Coke Production.—It used to be said that the County of Durham was the leading centre for the production of coke; but it has given first place to the Connellsville region of America. In that district, there are no fewer than 21,000 coke ovens, all but a comparatively small number being in operation. The production of coke is over 240,000 tons weekly, which is by far the largest quantity produced in any of the coke-making regions of the world. Very naturally, this plentiful supply of a cheap fuel has had the result of stimulating the smelting industries of the United States, until the production of pig iron and of steel is above that of any of the competing countries in the universe. Whether that vast production could be continued if the range of prices were to show such a fall as has been previously known is doubtful, but there would then be great competition both in coal and iron between the producers in various countries, as has been hinted at above.—*Newcastle Chronicle*.

SCIENTIFIC AND TECHNICAL DEPARTMENT OF THE IMPERIAL INSTITUTE.

THE DEVELOPMENT OF INLAND WATER CARRIAGE IN GREAT BRITAIN.

A considerable amount of attention has been devoted by manufacturers during the last few years to the possibility of securing a less expensive means of transport, especially for goods of comparatively low value, than is at present provided by the railway systems of the country. In view of the great development of water-carriage in France and Belgium and to a less, but increasing, extent in Germany, it is natural that in England also the question of utilizing this method of transport should be raised. In this connection interest attaches to a paper read at a recent meeting (April 30, 1902) of the Liverpool section of the Society of Chemical Industry, by Mr. A. Carey, M.Sc., on this subject, in which the author pointed out that, while this country possessed a canal system 4,050 miles in length, very little use is made of it at the present time, although before the introduction of railways canal transport was very common. The reasons for this lapse appear to be—(1) That the canals are owned in comparatively short lengths by independent companies, each charging its own rate, and so introducing great confusion where long journeys are made; (2) That on all the most important canals some portions are invariably held by competing railway companies, in whose interest the rates at such points are always high; (3) That the locks and water-way vary greatly in size, necessitating corresponding variation in the boats employed, or, on long voyages, of the largest boats which can be used in the smallest canal *en route*. The effects of these various difficulties may be seen in the following tabular statement, showing the canal route from Liverpool to London:—

Water-way.	Length.	Sizes of Locks.	Cost of Transport.
	Miles.	Feet.	
Regent's Canal	8½	90 × 18 × 5	The "through" rate is four shillings and sixpence per ton for the total distance of 245 miles, of which one shilling and sixpence is charged by the Birmingham Canal (15 miles long) because of an agreement with the local railway company.
Grand Junction Canal	101	80 × 14 × 4½	
Oxford Canal	5	80 × 14 × 4½	
Warwick and Hapton Canal	15	72 × 7 × 4	
Warwick and Birmingham	22	72 × 7 × 4	
Birmingham Canal	15	72 × 7 × 4	
Stafford and Worcestershire	1½	72 × 7 × 4	
Shropshire Union Canal	68	80 × 7½ × 4	
Mersey	10	80 × 7½ × 4	

The author proceeds to discuss the much more satisfactory conditions obtaining in the more important Continental countries: thus, in France, although the railway rates there are on the whole lower than in England, great pains have been taken to improve inland water carriage, so that at present the average rate is from 176d. to 22d. on the State canals, on which since 1870 £40,000,000 have been spent in improvements. In Belgium all the canals are owned by the State, which makes no charge for interest on capital, but charges a small amount to cover the cost of maintenance.

As regards the advantages and disadvantages of transport by water compared with that by rail, the author points out that the initial cost of canal construction is much less than that of railways, the figures for England being respectively £9,600 and £50,000 per mile, whilst the relative conveying powers of canals and railways are, according to the French Commission on Canals of 1872, as 50 to 100. The cost of maintenance is, according to the Report of the same Commission, about £90 per mile of canal, whilst the figure for railways in England in 1899 was £450 for the same distance. The cost of water carriage was stated to be in 1883 on the Aire and Calder Canal 24d. per mile for horse haulage and 103d. for steam haulage, whilst according to the French Commission the cost in the latter country in 1872 was 37d. per mile, and in America the usual amount is about 1d. at the present time. These figures compare very favourably with the cost of railway transport, which Mr. Carey estimates at about 38d. per ton per mile. On the other hand greater expedition in delivery is secured by railway transport, and when this difference in time of transit is considerable, account must be taken of the interest on the money realisable by the sale of the cargo. Canals are also liable to be stopped by ice in winter and by shortness of water in summer, although these are difficulties usually surmountable by modern engineers. In the discussion which followed the reading of this paper, several prominent manufacturers took part, and generally the opinion seemed to be held that support should be given to legislation tending to promote the formation of public trusts to take charge of the canals now in existence, and to make new ones where necessary, and it is understood that a Bill of this kind will be brought before Parliament in the near future.

EFFECT OF THE ALCOHOL DUTY ON CHEMICAL INDUSTRY IN ENGLAND.

During the last twenty years there has developed (especially on the Continent) an enormous industry in the manufacture of organic substances for use as dyes, medicinal agents, and explosives. It might have been supposed, in view of the premier position held by this country as a producer of chemicals, such as alkalies and sulphuric acid, that the newer branches of chemical manufacture would be likely to take root here, especially since there exists in the waste products of gas manufacture a large supply of the necessary raw materials. For various reasons, however, such a development has not occurred, and at the present time there is considerable discussion among those interested in chemical manufacture in this country concerning the removal of difficulties supposed to militate against the establishment of such industries in England; of these the duty which must be paid on alcohol by manufacturers is one of the most important, since, in Germany and other countries chemical works of the description already referred to are with certain restrictions permitted to use pure alcohol without the payment of any duty, or are granted a rebate on the alcohol consumed in the course of manufacturing operations. A paper enumerating the branches of organic chemical manufacture which are practically non-existent here as the result of the operation of this duty, was recently read to the Society of Chemical Industry, by D. O. Silberrad, Chemist to the Explosives Committee, and is published in the current number of the Society's *Journal* (June 30, 1902). The author points out that in the extraction of alkaloids, glucosides, and essential oils from plants, and in the manufacture of various pharmaceutical preparations in which alcohol must be employed as a solvent, although the latter is to a large extent recovered, yet there is an invariable loss of from five to ten per cent., which prevents the home-made article from competing on favourable terms with foreign products, on which, since they contain no alcohol, no Customs duty is chargeable. Most of the goods here enumerated cannot be made by the use of *methylated* spirit, since the impurities present in the latter accumulate in the finished product, causing deterioration in appearance and quality. The case is still worse where alcohol is employed as a solvent to enable two substances to re-act with each other, since in such operations part of the solvent is often destroyed, and so is no longer recoverable, even to the extent of the 90 per cent. mentioned in the previous case. It is, however, in the colour industry that the duty on alcohol is most oppressive, since in

the manufacture of many of the commonest artificial dyes, it is necessary to convert the alcohol by interaction with other substances into entirely new bodies used as starting materials for the dye manufacture, *e.g.*, the preparation of *diethylaniline* from aniline and alcohol costs in England, where duty-paid spirit must be used, 2s. 5½d. per lb., whilst in Germany the same chemical can be made from duty-free alcohol for 5½d. per lb. Similarly a large number of synthetic products such as sulphonal, phenacetin, antipyrine, etc., which are now extensively employed in medicine, cannot be made here for the same reason. The annual value of these two classes of materials to the countries in which they are made is estimated at about £2,000,000.

It is satisfactory to find that the representations made by chemical manufacturers to the Treasury officials have now led to a promise from the Chancellor of the Exchequer, that arrangements will be made to supply manufacturers with duty-free spirit. This concession appears to have been made with a view especially of encouraging the manufacture in England of nitro-cellulose, which enters largely into the composition of modern explosives. As an example of the effect which such concessions may have on the growth of industries of this class, it may be mentioned that, up to the year 1892, manufacturers of tinctures and extracts were allowed no drawback on such preparations when exported to the Colonies, with the result that export of this class of goods practically ceased, the trade being secured by Germany. In that year, however, the Excise authorities began to grant a rebate on the alcoholic contents of these goods, and since that time the whole of the trade has been practically regained. The new concession now to be given will also no doubt have many beneficial effects indirectly, since it should stimulate largely the manufacture of spirit from potatoes, which could be grown profitably on much of the Essex marsh land unsuitable for other crops.

THE PRODUCTION OF MIXED CARBIDES AND ILLUMINATING GAS.

The steady advance in the use of acetylene, especially on the Continent, has led to many efforts being made to improve and cheapen the production of calcium carbide, and since the chief item in the cost of this material is the electrical energy necessary for its formation from coke and lime, experiments have, as a rule, been made in the direction of pre-heating the reacting materials and so reducing the electrical energy required for their eventual fusion to carbide. It is possible, however, to effect a still greater reduction of cost by manufacturing a mixed carbide of lower melting point than the pure calcium carbide. The selection of a second oxide to be mixed with the lime in order to form the double carbide is a matter of great difficulty, but Professor Lewes, in 1896, found that manganese dioxide was a suitable material for this purpose, since the carbide of this metal furnishes, on treatment with water, not acetylene but methane, and the latter gas he had previously shown is a most desirable addition to acetylene when the latter is employed for illumination, since its combustion in burners is thereby rendered smokeless without impairing the high illuminating power. Laboratory experiments carried out by Professor Lewes at about that time showed that on the small scale it was quite possible to prepare a mixed carbide of manganese and calcium, which on contact with water furnished a satisfactory illuminating gas. Subsequently a French firm of carbide makers experimented on a large scale with this process, and found that carbide could be made by it in about half the usual time and with a saving of about 35 per cent. in cost, whilst the quantity of gas obtainable was 10 per cent. greater. These remarkable results have induced Messrs. Brame and Lewes to re-investigate this matter on a larger scale, and an account of their observations is contained in a paper contributed by them to the current number (June 16, 1902), of the *Journal of the Society of Chemical Industry*. Using small quantities of materials it was found quite possible to produce the desired mixture of carbides giving a good yield of gas, as the following table shows:—

Mixtures.			Composition of Gas obtained on addition of Water.		Theoretical Composition of Gas.	
Manganese Dioxide.	Lime.	Coke.	Methane and Hydrogen.	Acetylene.	Methane and Hydrogen.	Acetylene.
Per cent.	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.
50.0	20.0	30.0	51.6	48.3	44.0	55.9
60.0	12.0	30.0	68.1	31.8	84.2	15.8
63.7	8.5	27.2	76.2	23.7	89.7	10.2

When, however, the experiments were repeated on the manufacturing scale at the works of the Acetylene Illuminating Company at Foyers, it was found that with an excess of lime calcium carbide alone was formed, whilst, with manganese dioxide in excess, manganese carbide was obtained, but no calcium carbide. The following selections from the author's experiments illustrate this peculiarity:—

Mixtures.			Composition of Gas actually obtained.	Composition of Gas which should have been formed.	
Manganese Dioxide.	Lime.	Coke.		Methane and Hydrogen.	Acetylene.
Per cent.	Per cent.	Per cent.		Per cent.	Per cent.
59.4	12.8	27.7	{ Methane and hydrogen . . } { Traces of acetylene . . }	66.2	33.8
			Per cent.		
20.0	44.4	35.5	Acetylene	16.0	84.0
8.8	50.6	40.5	Acetylene	6.9	93.1
4.5	53.0	42.4	Acetylene	3.5	96.5
—	57.1	42.8	Acetylene	—	100.0

There appears to be no advantage, therefore, in mixing manganese dioxide in small quantities with the lime and coke for the manufacture of calcium carbide, but it is interesting to observe that, judging from the results of the first experiment recorded in the second table, it is possible to manufacture in this way practically pure manganese carbide, should a demand for this material ever arise. So far the experiments carried out have only included mixtures containing less than 20, or more than 50 per cent. of manganese dioxide, and it is possible that the required mixed carbide might result if mixtures containing this ingredient in proportions intermediate to these were employed, and in this direction the authors hope to be able to continue the investigation.

THE AGRICULTURAL AND MINERAL RESOURCES OF NATAL.

The development of the agricultural resources of Natal, when compared with those of other colonies, has progressed but slowly. Many parts of the colony are only suitable for pasture land, and, until comprehensive irrigation schemes are undertaken, Natal cannot become an agricultural centre; but now that peace has been concluded in South Africa and a Department of Agriculture has been established, there is good reason to expect, in the near future, greater industrial progress.

The following, summarised from the *Natal Directory* for 1902, briefly states the present condition of the agricultural and mineral resources:—

Along the coast tea, sugar, and arrowroot grow well, and experiments in coffee-planting are being made. Tropical fruits of all kinds grow luxuriantly, and much attention is being given to the extension of fruit farms and orange groves.

In the uplands and midlands the cultivation of peaches, apricots, plums, pears and apples, has recently been successfully accomplished. Of cereals, maize or Indian corn constitutes the main crop; oats and wheat are also grown, but the former is used only as forage and the latter—grown in the uplands—is subject to rust. The cultivation of barley has been undertaken, and so far success has attended the experiment.

Acacia mollissima or “black wattle” grows satisfactorily in many parts of the colony; the bark is used for tanning purposes, and the trunks stripped of the bark are used in the mines.

Pines, cypresses and other conifers, also red and white gums, have been successfully grown, and further large tracts of land are to be utilized for planting wattle, gum, casuarinas, iron-barks and cedar trees.

Natal is rich in indications of mineral wealth, for a great variety of minerals are known to exist, but with few exceptions the development of these resources is at present insufficient to show whether they will prove commercially valuable.

Coal-mining is a very important industry, the coal occurs in large quantity, and is of excellent quality.

Gold, copper, iron, nitrate deposits, gypsum and asbestos are the most important minerals found within the colony. The former has been discovered at Umzinto and in the Tugela Valley and also in several parts of Zululand. Excellent marble quarries have been opened in the neighbourhood of the Umzimkulu.

A Department of Mines has been established, and, although at present mining in Natal may be said to be in its infancy, the future will probably see her great natural resources properly developed.

THE UTILIZATION OF BLAST FURNACE SLAG.

The question of the utilization of blast furnace slag is, in consequence of its increasing accumulation, a very important one. Various attempts have been made in this direction, but so far its principal use, and that only to a limited extent, has been for making and repairing macadamized roads.

The utilization of slag for artificial flagstones suitable for street-footways and floors of buildings has recently been undertaken, and the manufacture of these is described in the *Scientific American* (Vol. LIII., p. 21,952).

Artificial flagstones have already been made by compressing a mixture of granite chippings or finely crushed stone and cement. Slag has an advantage over any natural stone for this purpose, as it contains a larger percentage of lime and so requires a smaller proportion of cement to form an agglomerated mass. The hardness and density of the stones and, consequently, their durability, depend to a great extent upon the pressure to which the mixture of slag and cement is subjected. This pressure is best applied by hydraulic power, and the press best adapted for the purpose is that known as the revolving-type flag press. This machine consists of a heavy revolving table made in the form of a cross, and attached at its centre to a fixed circular metal base; each of the arms of the revolving table is constructed so that a mould may be easily fixed into position. Two hydraulic rams of different sizes are provided, the larger is used for pressing the flagstones and is capable of applying a pressure of 4,500 pounds per square inch, and the other is to force the compressed mass from the mould.

The press is so adapted that by one complete turn of the revolving table four operations are completed; the mould is filled with the concrete, which is levelled by a quarter turn of the table, then brought under the large ram and compressed, and finally forced from the mould by the smaller ram. This mould is then ready to be refilled and, in this manner, the four moulds are kept constantly in use.

ALLOYS OF COPPER AND MANGANESE.

The process recently devised by Goldschmidt for the production of comparatively pure manganese has enabled investigators to experiment more freely with alloys of this metal, since it can now be obtained containing not more than 3 per cent. of impurities at a moderate price. Although alloys of copper and manganese have been made and used to a small extent, very little was until recently known about their physical and mechanical properties. This defect is supplied by the data contained in a paper, (*Journal of the Society of Chemical Industry*, June 30, 1902), contributed by Mr. E. A. Lewis, to a meeting of the Nottingham Section of the Society of Chemical Industry. It appears that the addition of manganese to copper furnishes a series of alloys of possible industrial importance, so long as the percentage of the former is kept below 30; above this amount the alloys become brittle and unstable. The specific gravities of the alloys decrease with increase of the manganese content, whilst the melting points on the whole rise, although breaks occur in the temperature curves between 15 and 40 per cent. of manganese, owing to the formation of a eutectic alloy, at these concentrations. The tensile strengths of the metallic mixtures increase with the addition of manganese until the content of the latter reaches 26.24 per cent., when a fall occurs. The micro-structure of the copper is not materially altered by addition of manganese until about 10 per cent. of the latter is reached, when the large crystals of copper are replaced by small crystals of the eutectic alloy of the two metals; the latter then persists until the content of manganese reaches 54 per cent., when a new alloy of remarkable hardness appears. The one per cent. alloy of manganese with copper has been employed in locomotive boiler tubes and is resistant to corrosion.

WEST INDIAN TIMBERS.

(By JOHN T. REA, F.S.I., Surveyor, War Department.)

(Continued from p. 184, July JOURNAL.)

44. KAKARALLI (*Lecythis ollaria*), from the Itoori-bisci creek, Essequibo river. There are two kinds common throughout the county of Essequibo, and known as the white and the black kakaralli. These woods are close grained and tough, and of a light brown colour; they are used for house-framing, building wharves, etc. It is said that barnacles will not eat or injure kakaralli. These trees grow tall and straight, but are too heavy to convert into spars. The average height is 80 feet, and they will square 16 inches free of sap. The inner bark of the white kakaralli is used by the Indians as a substitute for, and in preference to, paper for making their cigarettes, and is named “ouina.”

45. KAMARAKATA, from the upper Essequibo river. The tree is comparatively short, not averaging more than 50 feet in height, but has a large trunk. It can be had to square 22 inches free of sap, of which there is very little. It grows in Mahaicony, and on the Essequibo in low places near the river (often hanging over the water), and on the islands in and above the rapids. The wood is dark brown, close grained, heavy, and of a bitter taste, and resembles Hackia. It is very lasting, and is used for boat timbers, for which purpose it answers well.

46. KARAHURA, from the Moraballi creek, Essequibo river. It grows generally throughout the colony in dry places; its average height is 80 feet, and it can be had to square 30 inches. Karahura is one of the lightest of colonial woods, and is only fit for partition boards and other indoor work of a similar nature. The Indians use it for making canoes.

47. KAUTA-BALLI, from the same district. There are two or three varieties of this tree, distinguished by the size of their leaves. Kauta-balli grows to its largest size on clay soil mixed with gravelly ironstone. It is abundant on hilly land, and attains to an average height of 80 feet, and can be had to square 14 inches. The wood is useful for house-framing, is hard and has a close straight grain. The fruit is not edible; the bark, made into charcoal and ground to powder, is used by the Indian women to mix with the clay of which their pots, goglets, and other earthenware vessels are made.

48. KERITEE, or Kretti, from the Aroua-pia-kooroo creek, Pomeroon river, British Guiana. The tree averages 80 feet in height, and will square 20 inches, being plentiful in some localities. The wood has a strong aromatic scent, is light, and in colour and appearance resembles satinwood. It is useful for partitions, and the upper planking of boats.

49. KOOROO-BALLI, or Trysil, from the Moraballi creek, where it grows plentifully. The average height of the trees in the forest on the upper parts of the Essequibo river is 60 feet. On the coast lands and in the swamps at the back of estates, where large quantities are cut for firewood, it does not grow so large. The wood is dark, close grained, and suitable for making furniture; it can be had to square 10 inches free from sap. The bark is employed by the Indians in cases of dysentery.

50. KUMARA, or Tonkin bean (*Dipterix odorata*), from the Itoori-bisci creek, Essequibo river. The tree grows plentifully in some localities, especially above and on the islands in the rapids of the Essequibo river. The average height is 90 feet, and it will square 22 inches. Kumara is a close-grained, heavy, brown coloured wood, exceedingly tough and durable, and is useful for cogs, shafts, and any other purpose where a strong wood capable of resisting great pressure is desired. This tree yields the Tonkin beans, well known in the colony; they are used by the Indians to perfume their hair-oil, and when put among clothing are supposed to keep away moths and other insects. An oil can be extracted from the beans.

51. KURAHARA, from the same place. The tree grows in sandy soil and on the edges of swamps; it is very straight, with dark green leaves. The average height is 90 feet, and it will square 20 inches free of sap. The wood is red, light, and like cedar; it is employed for making canoes, planking boats, and for spars. It has a resinous gum.

52. KURAROO, or Bat-seed, from the same place. It is a tree common throughout British Guiana, and may be seen growing in Georgetown, where it is known as Wild Olive. It does not grow very tall, but the diameter of the trunk is great in proportion to its height, which averages 60 feet, and it can be had to square 3 to 4 feet, in short lengths. The wood is hard but not very durable, and is little used; it takes a fine polish and would be suitable for furniture.

53. LANCEWOOD. There are two varieties—Black Lancewood (*Bocagea virgata*), and White Lancewood (*Bocagea laurifolia*). Found in Cuba, Hayti, Jamaica, etc. A tall slim tree, growing straight to 30 feet high, and 12 inches diameter. The wood possesses great elasticity, and is much used in carriage building, for which purpose it is exported. Jamaica spars fetch higher prices in the home market than similar wood from other places. The export from Jamaica for twenty years has been valued at £31,275.

54. LAURIERS, or Laurel trees. Found in nearly all the islands. There are more than a dozen varieties, known by such names as Laurier Canelle, Laurier Cyprès, Laurier Fourmis, Laurier Marbré, Laurier Piant, Laurier Sifrene, Laurier Zabel, etc. Of these the most important is Laurier Canelle, or Cinnamon Laurel. This tree is 30 to 35 feet high, and 2 to 3 feet diameter. The wood is of a bright brownish colour, with a strong agreeable smell. It is plentiful, and used for telegraph posts, and is suitable for most purposes for which pitch pine is employed. Weight, 30 lb. per foot cube. Value about £7 per ton.

Laurier Piant, or Piant, or Smelling Laurel, is also of considerable utility. The tree is likewise 30 to 35 feet high, and 2 to 3 feet diameter. The wood has a pleasant smell somewhat similar to cedar, and is said to be free from the attacks of wood-ants. Withstands the weather, but warps, and lasts in the ground without any protection of charring or tarring. Employed for inside and outside work, boards, furniture, telegraph or other posts, etc., and general purposes. Weight, 52 lb. per foot cube.

55. LIGNUM VITÆ, or Gaïac (*Guaïacum officinale*). Found in Jamaica, Trinidad, St. Lucia, etc. A low tree up to 20 feet high, and 18 inches diameter. It is slow-growing, thriving best in well-drained and dry districts, and stands drought better than many trees. The heartwood is of a dark greenish-brown colour, owing to the deposition of guaiacum resin; the sapwood is nearly yellow. The wood is exceedingly dense, hard, heavy, and tough; and will resist white ants. Weight, 76 lb. per foot cube. It is extremely useful for sheaves and blocks of pulleys, rulers, skittle balls, and other turnery purposes. Sometimes employed for machine bearings, where its qualities of hardness and durability render it preferable to metals. Crushing strength, 3·87 tons per square inch. The wood is used in the Bahamas for hinges and fastenings owing to the quick corrosion of iron. The gum-resin guaiacum is got from the tree and used as a medicine. This may be readily extracted from the wood by making an incision in the middle and then building a fire at both ends of a log. The bark is employed in Trinidad for preparing an effervescent drink, locally known as "mawbee." It is an official medicine of the British Pharmacopœia, where its uses are fully described.

56. LIZARD WOOD (*Vitex divaricata*, Sw). Grows in Trinidad, St. Lucia, etc. Termed "Fiddle wood" in the former place. A large thick tree, about 30 inches diameter and 25 feet high. The wood is strong, and one of the best and most lasting for house building. It is employed for inside and outside work, for shingles, posts in the ground, etc., and is durable in water. Weight, 75 lb. per foot cube.

57. LOCUST, or Simiri, or Courbaril (*Hymenaea Courbaril*). Found in British Guiana, Jamaica, Trinidad, St. Lucia, etc. It is abundant, and grows best in white sandy soil, to as much as 5 feet diameter. There are two varieties of the tree—Simiri and K'wanarri—distinguished by the size of their bean-pods. The wood is of a reddish-brown colour, streaked, close-grained, extremely hard and tough. It resembles mahogany, but is much harder, and is liable to rot in the ground. Suitable for cabinet work and furniture, as it takes a fine polish. On account of its freedom from splitting or warping it is well adapted for mill timbers, cogs of wheels, and engine work, and makes good trenails for fastening planks. Crushing strength 5·17 tons per square inch. Weight, 59 lb. per foot cube. Value, £12 per ton. The Indians make wood-skin canoes from the bark. A fragrant amber-like resin, known as West Indian copal, or the Gum Animi of commerce, exudes from the stem. This gum is found in large quantities where a tree has rotted away, and small amounts may be procured by tapping. When this Gum Animi is dissolved in highly rectified spirits of wine it makes one of the finest varnishes known.

58. LOGWOOD, or Campêche wood (*Hæmatoxylon Campechianum*). Found throughout the West Indies, sometimes in dense thickets in marshy places. It is a small bush-like tree, not unlike English hawthorn, and generally acquires in about twenty years a diameter of a foot, with a total height of 20 feet. The heartwood is of a dark red colour, hard, and used for posts and cabinet work. It is, however, solely exported for dyeing and colouring

wines, for which it is, perhaps, the most important of all dyestuffs. Logwood grows best, and produces finer heartwood, on moist rich soils, where there is abundance of vegetable matter. It makes a strong and durable fence, but must be kept well pruned. There are several species of logwood, and the largest supplies come from Campêche and Yucatan. It is a powerful astringent. The yearly export from Jamaica varies from 22,000 to 115,000 tons. The quantity exported from St. Lucia in 1896 was 1,904 tons, valued at £4,284. The average annual export from Honduras is 17,000 tons.

59. MAHOGANY (*Swietenia mahogani*). This celebrated timber comes chiefly from Central America as "Honduras" or "Bay" mahogany, or from the West Indies as "Spanish mahogany." The tree is of comparatively rapid growth, reaching maturity in about 200 years, the trunk exceeding 40 to 50 feet long and 6 to 12 feet diameter. It is very handsome, with enormous branches of solid timber; and, rather strangely, when it springs from low levels and rich soil the wood is most inferior, being poor in colour, soft and spongy, and consequently almost valueless. That, however, which has been grown without nourishment on high levels, save what it derives from the atmosphere, is hard, figured, densely close in texture, as well as rich and deep in colour, all qualifications which enhance its worth. It is also a curious fact that the tree does not seem to have any partiality, as it will flourish in low marshy ground, or in a deep alluvial soil, or even on rocks to all appearance barren of earth; in fact, wherever the seeds chance to drop. Its development is more rapid in the shade than in the open.

The following extract is from a well-known authority on timbers:—"Mahogany attains its greatest development and grows most abundantly between 10° N. lat. and the Tropic of Cancer, flourishing best on the higher crests of the hills, and preferring the lighter soils. It is found in abundance along the banks of the Usumacinta, and other large rivers flowing into the Gulf of Mexico, as well as in the larger islands of the West Indies, such as Cuba, Jamaica, Bahamas, etc. British settlements for cutting and shipping the timber were established so long ago as 1638-40, and the right to the territory has been maintained by Great Britain, chiefly on account of the importance of this branch of industry. The cutting season usually commences about August. It is performed by gangs of men, numbering twenty to fifty, under the direction of a "captain" and accompanied by a "hunter," the duty of the latter being to search out suitable trees and guide the cutters to them. The felled trees of a season are scattered over a very wide area. All the larger ones are "squared" before being brought away on wheeled trucks along the forest roads made for the purpose. By March or April felling and trimming are completed; the dry season by that time permits the trucks to be wheeled to the river banks. A gang of forty men work six trucks, each requiring seven pair of oxen and two drivers. Arrived at the river, the logs, duly marked, are thrown into the stream; the rainy season follows in May and June, and the rising current carries them seawards, guided by men following in canoes. A boom at the river mouth stops the timber, and enables each owner to identify his property. They are then made up into rafts, and taken to the wharves for a final trimming before shipment. The cutters often continue their operations far into the interior, and over the borders into Guatemala and Yucatan. Bahama mahogany grows abundantly on Andros island and others of the Bahama group. It is not exceeded in durability by any of the Bahama woods. It grows to a large size, but is generally cut to small dimensions, owing to the want of proper roads and other means of conveyance. It is principally used for bedsteads, etc., and the crooked trees and branches for ship timber. It is a fine, hard, close-grained, moderately heavy wood, of a fine rich colour, equal to that of Spanish mahogany, although probably too hard to be well adapted for the purposes to which the latter is usually applied. Honduras is best for strength and stiffness, while Spanish is most valued for ornamental purposes. Honduras mahogany is found in the country round the bay of Honduras, the trees being of considerable size. The average annual export is 3,000,000 feet. It is of a golden or red-brown colour, of various shades and degrees of brightness, often very much veined and mottled. The grain is coarser than that of Spanish, and the inferior qualities often contain grey specks. This timber is very durable when kept dry, but does not stand the weather well. It is seldom attacked by dry-rot, contains a resinous oil which prevents the attacks of insects, and is untouched by worms. It is strong, tough, and flexible when fresh, but becomes brittle when dry. It contains a very small proportion of sap, and is very free from shakes and other defects. The wood requires great care in seasoning, does not shrink or warp much, but if the seasoning process is carried on too rapidly it is liable to split into deep shakes externally. It holds glue very well, has a soft silky grain, contains no acids injurious to metal fastenings, and is less combustible than most timbers. It is generally of a plain straight grain and uniform colour, but is sometimes of wavy grain or figured. Its market forms are logs 2 to 4 feet square and 12 to 14 feet in length. Sometimes planks have been obtained 6 to 7 feet wide. Mahogany is known in the market as "plain," "veiny," "watered," "velvet-cowl," "bird's eye," and "festooned," according to the appearance of the vein formations. The weight varies from 35 to 53 lb. per foot cube. The cohesive force is 11,475 lb.

"Cuba or Spanish mahogany, from the island of Cuba, is distinguished from Honduras by a white, chalk-like substance which fills its pores. The wood is very sound, free from shakes, with a beautiful wavy grain or figure, and capable of receiving a high polish, when it is of a lighter yellow colour than Honduras. It is used chiefly for furniture and ornamental purposes, and for shipbuilding. The logs as imported are 20 to 26 inches square and 10 feet long. The cohesive force is 7,560 lb., and the strength, stiffness, and toughness are respectively 67, 73, and 61 in Spanish, and 96, 93, and 99 in Honduras.

"Mexican mahogany shows the characteristics of Honduras. Some varieties of it are figured. It may be obtained in very large sizes, but the wood is spongy in the centre, coarse in quality, and very liable to star-shakes. It is imported in barks 15 to 36 inches square, and 18 to 30 feet long.

"St. Domingo mahogany and Nassau (Bahamas) mahogany are hard, heavy varieties, of a deep red colour, generally well veined or figured, and used for cabinet work. They are imported in very small logs, 6 to 12 inches square, and 3 to 10 feet long."

Jamaica mahogany is very fine, but the supply is almost, if not quite, exhausted, as the proprietors of estates, knowing that the tree must be about 200 years old before it is fit for felling, will not attempt to make plantations. In the great houses of West Indian estates there are many specimens of beams and rafters of mahogany, very old and in good condition; but at the present time it is very seldom employed, only those trees being cut which are found on waste pastures and in forest near cultivation, and they rarely give more than 10 inch planks. At no time has mahogany been largely exported from Jamaica, and recent trial shipments have been made at a loss. As a timber, the present stock is undoubtedly inferior to the Honduras varieties, having neither the ornamental grain and toughness of the one, nor the splendid dimensions acquired by the latter. With age it becomes of a good colour, and is always a handsome wood. Formerly the wood from Jamaica was specially reputed for its mottled grain.

The builder uses mahogany for handrails, furniture, joinery, cabinet and ornamental work, etc., but it is not fit for external work. It has been extensively employed in machinery for cotton mills, and has been largely used in shipbuilding, for beams, planking, and in many other ways as a substitute for oak, and found to answer exceedingly well. The wood is very durable in the dry, and not liable to worms. On the whole it is remarkably free from defects, converts easily and with little loss, and warps and twists less than any other wood. Taking everything into consideration mahogany is the most highly prized of all ornamental woods, and still holds the field.

(This article will be concluded in the September JOURNAL.)

LECTURES AND PAPERS.

"MEREJKOVSKI'S RESURRECTION OF THE GODS."

(By Miss HELEN COLVILL.)

(ANGLO-RUSSIAN LITERARY SOCIETY.)

At the meeting of the A.R.L.S. on July 1, Mr. E. A. Cazalet, the president, took the chair, and Miss Helen Colvill (Catherine Wylde), author of several popular novels, read an interesting paper entitled "Merejkovski's Resurrection of the Gods."

In introducing the lecturer Mr. Cazalet spoke of the unfair treatment which Merejkovski had received at the hands of many of the Russian critics, who entirely failed to appreciate him. The chairman rejoiced to think that the A.R.L.S. would be instrumental in bringing this talented young writer to the notice of the British public, and in promoting his estimation at his true worth.

Miss Colvill said that in spite of the growing interest in the language and literature of Russia, most English people still read Russian novels in translations which unfortunately often failed to give the full force and meaning of the originals. This was notably the case in the French version of Merejkovski's *Resurrection of the Gods*. The translator had certainly produced a brilliant story, but it was suitable merely to beguile a railway journey, or to while away a few idle hours. He had completely lost sight of the interesting philosophy and mystical ideas to which Merejkovski's novels—especially his historical novels—gave expression. These ideas were introduced chiefly in the form of symbols and parables, so that it was quite possible to find the novels brilliant, interesting and historically instructive without penetrating below the surface. To the more serious reader, however, the theories worked out in Merejkovski's books would be readily apparent. He believed that the Christian and Pagan spirit were complementary, and not contradictory to each other, and that in the next age the superior being who might succeed man might combine the characteristics both of the profane and the Christian systems. Certain noteworthy men had arisen who were forerunners of the future being. To this class belonged the men whom Merejkovski had selected as the heroes of some of his novels; for instance, the Emperor Julian in *The Death of the Gods*, and Leonardo da Vinci in *The Resurrection of the Gods*. Finally Miss Colvill gave an interesting description and analysis of this latter work, which was to appear immediately in English under the title of "The Forerunners." It contained a delightful account of the great artist, with vivid pictures of his contemporaries and of the life of his day.

Among others, Professor Ilovaiski, of Odessa University, an eminent Russian Professor of Political Economy and kindred sciences, and Mr. Davison, took part in the remarks which followed the lecture. Mr. Marchant compared Merejkovski's treatment of Christian and pagan systems to that of other authors—George Eliot, Maikov, etc. Mrs. Rosa Newmarch drew attention to the interesting fact that Merejkovski's novels dealt with very different scenes and subjects from those handled by the majority of his countrymen. His inspirations seemed to have been drawn from foreign history and foreign countries, a somewhat unusual thing for Russian authors.

Mr. Kinloch thought that Merejkovski could never become a popular writer. His works were suitable for men of learning and were more like dissertations than novels.

The lecturer explained that M. Merejkovski was leading up to a new work, of which Peter the Great and his reforms would be the subject.

The chairman, in submitting a vote of thanks to the lecturer, pointed out that M. Merejkovski was a young man of ideas and ideals, whose object was to supersede the vulgar and sordid element, now rampant in some sections of Russian literature, and to replace it by the higher aspirations of art and classical beauty.

In this respect the author was following the lead of Pushkin, who in the last years of his life devoted his genius to pure art in literature, discarding politics and polemics, etc. in his writings.

PROCEEDINGS OF INSTITUTIONS.

THE LONDON CHAMBER OF COMMERCE.

An address on the Monroe doctrine was given by SIR FREDERICK POLLOCK, at a meeting of the Chamber, on the 11th ult., when Mr. MARTIN DEED occupied the chair.

Sir Frederick Pollock, after an historical survey of the origin of the doctrine, pointed out that President Monroe's declaration was contained in a domestic, not an international, document, being addressed to the Congress of the United States only. Even if it had been formally adopted by Congress as a declaration of the policy of the United States, it could not have varied or added to the law of nations, and it did not purport to do so. Statesmen of the United States had, with very few exceptions, not expressly referred to Monroe's message, or the Monroe doctrine by name, in communications made to other Powers. The Monroe message did not lay down any claim of right, but stated the principles which would guide the United States in exercising its rights and defending its interests. Strictly, Monroe's declaration was not of any formal validity at all. It was not binding on anyone but his own Ministers. Its importance was derived from its substantial but informal adoption by successive Presidents and by the people of the United States.

As there was nothing binding in the literal terms, so there was nothing to prevent development of the principle on new occasions. The application of the Monroe doctrine was not to be found so much in particular historical and diplomatic incidents as in the whole course of American policy, as, for instance, in connection with the French expedition to Mexico.

In 1866-67 the French evacuated Mexico, but, meanwhile, extensions of the doctrine were attempted in two directions:—First, to support acquisitions of new territory in the west and south, nominally as a national security, really as new ground for slavery. That was one principal motive for the conquest of part of Mexico and the annexation of Texas, though the acquisitions were not now to be regretted. Then there was the objection to the existence of even ancient possessions of European Powers in America. In England an influential school at that time regarded the separation of the colonies from the mother-country as inevitable and not far distant.

The people of the United States might well feel strongly that, if England were to quit Canada, no other European Power must be allowed to acquire sovereignty or predominance there. There was also the feeling that the existence of a colonial dependency of any European State on the North American Continent was in itself contrary to the principles and interests of the United States. This feeling was strong among American publicists down to our own time. Whatever might have been said for it once, it was now founded on error in a vital fact. The self-governing Commonwealths of the British Empire were not Dependencies, and their union under the Crown, so far from being likely to entangle them in any aggressive policy of Great Britain, was more likely to restrain them from any rash adventures on their own account.

Down to a recent time, many persons in the United States supposed the British monarchy to resemble the despotic monarchies of the Continent. It alluded to the support which Canning gave to the Monroe doctrine, and said the sympathy of the British Government with it had been acknowledged by United States Ministers. We should be well advised, perhaps, to let it be known that not only did we not regard the doctrine in its true intent as anti-British, but that, on the contrary, we were quite willing to take our share in maintaining it, should the necessity arise. He was not sure that we might not have something to

learn from the Monroe doctrine in other parts of the Empire. It was conceivable to him that we, including our new Dutch citizens, might find occasion for something like a Monroe doctrine in South Africa—possibly in the lifetime of some of those present. The Monroe doctrine really stood for the determination of the English-speaking nations to preserve their ideals of political and spiritual freedom against all external interference. It was defensive, not aggressive; a security for peace and progress in the civilised world.

THE LIVERPOOL CHAMBER OF COMMERCE.

Under the auspices of the Liverpool Chamber of Commerce, Mr. J. E. WALLER, M.I.C.E., consulting engineer to the South Lancashire, Hastings, Isle of Thanet, St. Leonard's and Bexhill, and Colombo Tramways, delivered an address on "Through Traffic on Tramways for Passengers and Goods," at the Exchange Station Hotel, Liverpool, on the 21st ult. In the unavoidable absence of Sir Alfred Jones, Mr. G. H. COX presided, and expressed his conviction that the cheapening of inland transit was really of much greater importance to the great body of manufacturers in the country than the question of tariffs and subsidies. If they had anything like as cheap transit as in the United States and in other countries, manufacturers would be able to compete not only on as favourable but on better terms for the international trade of the world than their Continental rivals.

Mr. Waller referred to the facilities for through traffic on tramways. Although a journey might take longer by tramcar than railway, it must be remembered that the tramway passengers would not be confined to a limited time-table, but would have a frequent service, so that they might start when they were ready and return when convenient. Moreover, the cars would pick up a large percentage of passengers practically at their own doors, and the fares would be cheaper, which would cause many people to prefer the cars even if journeys occupied a little longer. There was probably no other district which could offer such facilities for through traffic on tramways as South Lancashire.

The proposed carriage of goods by tramways was in no sense novel, and in the South Lancashire district there was an enormous goods traffic. The purely local traffic consisted principally of coal, bricks, building materials, hardware, and machinery, of which there was an immense amount. This was at present carted, for it was impossible for the railway companies to deal with it, there being no sidings to connect the lines with mills and brickfields. The cost of double handling and cartage involved over and above the railway rates rendered a single cartage from the works cheaper, as well as more convenient and expeditious. A considerable amount was conveyed by canal and cart, a large traffic in raw cotton being dealt with in the latter way both from Liverpool and Manchester, as the rates were cheaper, excessive handling and transhipment being avoided, and the delivery being more expeditious. The existence of that considerable road traffic indicated pretty clearly that, if a cheaper and more expeditious service for goods on the tramways were organized, a very large traffic would be available.

In connection with the South Lancashire tramways it was proposed wherever practicable to lay sidings to the large collieries, works and depôts along the tramway routes, and already a number of probable customers had signified their desire to have such sidings connected with their establishments. To accommodate through traffic it would be necessary to provide depôts at convenient points of the tramway system. The depôts of the company, whether at the Liverpool Docks or at any point on the company's system, would all be worked in a similar manner. The process proposed might be illustrated by taking the case of goods coming to Liverpool by sea for delivery within the district. Such goods would be loaded from the quays or dock warehouses on to an ordinary road lorry, but the lorry would be provided with one or more of the company's crates, and the goods, where practicable, would be packed in such crate. The lorry would then proceed alongside the stage or platform at the receiving depôt, be rolled off by means of rollers on to the stage, whence it would be transferred to a deck wagon on an adjoining siding. A train of wagons would then be ready to proceed on its journey during the following night time. The traffic would be conveyed at considerably less cost than at present. It was believed that if facilities were given to organize such a traffic the advantages would be so fully appreciated that it would grow rapidly to the full carrying capacity of the tramways, and inaugurate facilities hitherto unobtainable for the distribution of goods. Replying to a vote of thanks, Mr. Waller said they were going to help in a small degree in the solution of cheap carriage.

THE SOCIETY OF CHEMICAL INDUSTRY.

The Society of Chemical Industry held its annual general meeting on the 9th ult., in the Arts Theatre of University College, Liverpool. Illness prevented the attendance of the president, Mr. Ivan Levinstein, of Manchester, and the chair was taken by DR. JOSEPH W. SWAN, F.R.S. The report of the Council stated that the number of members on the register was now 3,786, as compared with 3,635 at the last annual meeting. In January the Council acceded to the application of 32 members and 21 candidates for membership residing in the Dominion of Canada, to form a Canadian section of the society. Professor W. R. Lang, of the University of Toronto, was subsequently elected chairman, with Mr. Alfred Burton as hon. local secretary. The medal had this year been awarded to the ex-president, Dr. Joseph W. Swan, F.R.S., for conspicuous services to applied science. An invitation had been received from the New York section to hold the annual general meeting of the society in that city in 1904.

The presidential address, prepared by Mr. Levinstein, was read by Mr. THOMAS TYRER (London), a past president. The subject was "Education and Legislation—their Influence on Trade and Industry." Mr. Levinstein's address began by stating that the expectation of Cobden and other free-traders of half a century ago that England would become the emporium and workshop of the world had been realized for a time, but that we had now passed into a new stage. We had already lost the premier position in the world as manufacturing country, to the United States. The question for us now was to maintain the second position in face of the increasing rivalry of Germany. What were the factors that made for Germany's advance in industry and commerce? (1) Superior economy and attention to detail; (2) the possession of more trained brains than any other country; (3) a close alliance between legislation and science on the one hand and industry and trade on the other; (4) a national system of railways and canals, with internal and external freight charges averaging less than one-third of our own; (5) cheaper skilled labour, with longer hours than our own; (6) a large supply of "unskilled labourers" trained to habits of punctuality and discipline by military service; (7) protective tariffs; and (8) patent law system protecting the interests of the public as well as those of the inventor. Four measures required our immediate attention—(1) The appointment of a competent and expert Minister of Commerce; (2) nationalization and extension of our canals and waterways; (3) a measure for very largely extending and improving our system of secondary education; and (4) a reform of our patent laws. Parliament, largely composed of men who regarded it as a first-class club, was indifferent to commercial matters; the Board of Trade was directed by distinguished but overworked officials naturally adverse to changes.

The question of cheap freight demanded our closest attention. Government control of railways and canals in Germany, intelligently exercised, had been of immense value to German commerce. From our railway companies there was little hope; they were over-capitalized, and their working expenses were greater than those of our competitors. But

reform of our waterways was within practical politics. It was owing to the canal system of Germany and her system of low freight charges that chemical manufacturers in Berlin could import and distribute certain goods cheaper than manufacturers in Manchester. The freight from Liverpool to Manchester (31 miles) was twice as great as from Hamburg to Berlin (174) for about one-sixth the distance. The author showed how gravely English freight charges affected cost of production and distribution in this country. It cost more to send cheese from Cheshire than from New York to London, and more to send cattle from Northumberland than from Chicago to Liverpool.

The question of education was one of vital importance; but let them be quite clear on one point, the burning question for trade and industry was neither the question of primary education, which was fairly satisfactory, nor that of higher technical or commercial education, but the question of efficient non-specialized secondary education. He doubted if the new Bill would or could provide what was wanted. The financial provision for new secondary schools was totally inadequate if we wished to place England on a level with Germany in this matter. Schools alone would not suffice—we must be able to induce parents to keep the boys at school till 16 or 18, and we must spend large amounts in scholarships if we were to induce a sufficient number of parents to let their boys remain at school till 18 and so to obtain trained brains comparable in number and capacity with those of Germany. The millions of money spent on technical education in this country had been in the main sadly wasted. Education was a matter of time, but there was one reform that would promptly have a great and beneficial effect on our national industries—the reform of our patent laws. Our patent legislation simply offered a bonus to foreign rivals to manufacture abroad the articles for which we had granted British monopolies.

Mr. E. K. MUSPRATT, in the absence of the president, presented the society's medal to Dr. Swan, and gave a sketch of the valuable work he had accomplished in connection with electrical engineering and chemical industry. Mr. George Beilby was appointed a representative on the governing body of the Imperial Institute. On the invitation of the Yorkshire section, it was decided to hold next year's meeting at Bradford.

COMMERCIAL INTELLIGENCE DEPARTMENT.

CORRESPONDENCE AND ENQUIRIES.

The following are given as specimens of some of the enquiries which have been addressed to, and satisfactorily answered by, the Institute during the past month (July).

*** All communications must be authenticated by the name and address of the writer. Enquiries which would involve special applications or expense will be a matter of arrangement with the correspondent.*

T. B., *Liverpool*.—General information on Australia and Cape Colony.

H. D., *Huddersfield*.—Names of fancy stationery firms.

E. A. C., *Herts*.—Brewing industry of Cape Colony.

S. & Co., *London*.—Duty on linoleum in Egypt.

Verbal.—Importers of bamboo.

„ Sources of information on the subject of the world's timber resources.

REQUIREMENTS REGISTRY.

In order to provide correspondents with an opportunity of making known special "wants" or "needs" in the British Colonies, India, and Foreign Countries, space will be regularly devoted to the publication of approved notices in the *IMPERIAL INSTITUTE JOURNAL*. Notices, as a rule, should not exceed 25 words in length, for which a charge of 2s. 6d. will be made for each insertion. Special arrangements can be made for longer notices.

SPECIMENS OF FOREIGN AND COLONIAL WOODS desired. Purchase or exchange. Names and localities must be well authenticated. Address—HERBERT STONE, BRACEBRIDGE-STREET, BIRMINGHAM.

THE CURATOR OF THE CANADIAN SECTION OF THE IMPERIAL INSTITUTE is prepared to furnish information about Canadian Trade and to supply names of importers, manufacturers, shippers, etc.

The following trade enquiries have been received at the Canadian Section of the Imperial Institute, from the Curator of which Section further particulars may be obtained:—

Home Enquiries.—A firm possessing offices in London and Montreal, and able to furnish first-class references, is prepared to act as Canadian agents for manufacturers of machinery, engineering and similar classes of goods.

A north country firm asks for the names and addresses of exporters of Canadian iron ores.

Canadian Enquiries.—A Canadian firm of printers wishes to be placed in communication with United Kingdom makers of calendar backs, who can supply large variety of designs.

A New Brunswick firm manufacturing birch, beech, maple and ash to specification for the production of spokes, shafts, poles, and other carriage and wagon builders' appliances, desires the addresses of United Kingdom importers of their goods.

A Canadian company who can furnish good references wishes to hear from United Kingdom dealers in druggists' sundries, such as hair, tooth and hand brushes, combs, drugs and novelties, who seek Canadian resident agents.

MAPS AND CHARTS.—RECORDS.

[The entire collection of maps (with the exception of a few atlases and maps issued by private firms) consists of authoritative publications of the various government cartographical departments. Such as: the One-inch Ordnance Survey of Great Britain and Ireland, a complete set of Admiralty Charts, and a selection from the maps compiled in the Intelligence Division of the War Office; the monumental "Indian Atlas," and a large number of the publications of the Surveyor-General's Office, Calcutta; the Geological Survey of Canada, and the Government Surveys of Victoria and New South Wales. In the arrangement of the collection, the geographical classification of the War Office Intelligence Department catalogue has, with some modifications, been followed.]

ADDITIONS TO THE COLLECTION OF MAPS DURING JULY, 1902.

ASIA.

India. *Survey of India Office, Calcutta.*

INDIAN ATLAS, quarter-sheets, 23 N.W., 76 N.E., 76 S.E., 77 S.W., 86 S.W.

WESTERN BENGAL, sheet No. 9.

DISTRICT MONGHYR, sheets 5 and 6.

„ SHAHABAD.

BOMBAY SURVEY, sheet No. 231.

BURMA SURVEY, sheet No. 145.

CENTRAL INDIA AND RAJPUTANA SURVEY, sheets Nos. 120, 267, 278, 408, 451.

MADRAS SURVEY, sheet No. 76.

NORTH-WESTERN PROVINCES AND OUDH SURVEY, sheet No. 119.

NORTH TRANS-FRONTIER, sheet No. 35.

SIND SURVEY, sheet No. 9.

MAP OF THE SOONDURBUNS.

CHART OF TRAVERSE, sheets Nos. 19, 79.

CHART OF TRIANGULATION AND TRAVERSE, sheets Nos. 21, 40, 71.

INDEX TO THE STANDARD SHEETS OF THE CENTRAL PROVINCES.

„ „ „ „ „ NORTH-WEST PROVINCES AND OUDH.

CHARTS AND PLANS.

Published by the Hydrographic Department, Admiralty, during May and June, 1902; J. D. POTTER, Agent, 145, Minorities, London, E.C.

No.

New Charts.

- 3227 to 3238 Atlas of monthly wind charts for coasts of South America.
1344 North Atlantic. Tidal streams amongst the Færoe islands.
3258 England, east coast. River Tyne, Jarrow Slake to Elswick.
2669 The Channel islands and adjacent coast of France.
2644 France, north coast:—Ile d'Ouessant to Plateau des Roches Douvres.
3264 Newfoundland, south coast:—St. Mary's harbour and adjacent approaches.
3263 Newfoundland, south coast:—Salmonier river and Colinet harbour.
3265 Newfoundland, south coast:—Long harbour and St. Croix bay and adjacent anchorages.
3257 Canada. Lake Huron:—Chantry island to Cove island.
3253 South America, west coast:—Plans on the coast of Chile.
3268 Central America, west coast:—Panama road.
3271 Vancouver island and British Columbia. Plans in Broughton and Johnstone straits:—Alert and Blinkinsop bays.
625 Africa, west coast:—River Congo.
3252 Central Africa:—Victoria Nyanza (northern portion).
3255 Central Africa. Victoria Nyanza:—Entebbe bay.
3256 Central Africa. Victoria Nyanza:—Port Florence.
3267 Plans on the west coast of India:—St. Mary isles. Mangalore harbour.
976 Philippine islands:—Manila bay. Plan added. Port of Manila.
3283 Philippine islands, west coast:—Ports Salomague and Sual.
3274 China. Upper Yang tse kiang. Tung ting lake and Siang river.
3224 Japan, Kiusiu, north coast:—Iki island.
1596 Harbours and anchorages on the coast of Italy. Plans added:—Port Salerno. Port Torre del Greco.
1292 South America, east coast. Plan added:—Atlas anchorage.
632 Africa, west coast. New plan:—Angra Pequena.
934 Eastern archipelago. New plan:—Ketapang bay.
3131 Anchorages in New Hebrides islands. Plans added: Talomaco and De la table anchorages. Requin bay.

Charts that have received additions or corrections too large to be conveniently inserted by hand, and in most cases other than those referred to in the Admiralty Notices to Mariners.

No.

- 2793 England, south coast:—Cowes harbour.
3129 White sea:—Yugorski strait.
2297 Baltic sea. Gulf of Bothnia, sheet ii:—Hango head to South Quarken.
2298 Baltic sea. Gulf of Bothnia:—Nystad light to Stor Fiård.
185 Germany, north coast:—Port Swinemünde and approaches to Stettin.
1506 France, south coast:—Port and roadstead of port Vendres.
2471 United States, east coast:—New London harbour.
2854 Harbours in the gulf of Mexico:—Vera Cruz.
1938 South America, east coast:—River Uruguay.
553 South America, east coast:—Cape Dos Bahias to Tova island.
2885 United States, west coast:—San Diego bay, etc.
2839 United States, west coast:—Columbta river.

No.

- 1456 Africa, west coast:—River Cameroon with Ambas islands.
705 Madagascar:—Pasindava bay to Nosi Shaba.
746 India, west coast, sheet ix:—Mulki to mount Dilli.
69 Ceylon:—Pambam pass.
755 Bay of Bengal:—False point anchorage, etc.
942a Eastern archipelago, eastern portion, including Flores, Banda, and Arafura seas.
2636 Philippine islands:—Strait of Makassar, north part.
1258 Korea:—Approaches to Séoul, etc.
532 Japan:—Simonoseki strait.
1041 Kamchatka:—Avatcha, outer bay.
1670b Australia, east coast:—Moreton bay, sheet 2.
2422 Australia:—Torres strait, N.E. and east entrances, with outlying reefs.

THE CANADIAN TIMBER TRADE.

A recent issue of the *Canadian Lumberman* contains the following observations of the Canadian timber trade, which appear worth noting.

To one who for the first time travels over the Canadian Pacific Railway between the Georgian Bay and the Pacific Coast, the impression is one of surprise regarding the extent of the Canadian territory. Some of the land, of course, is barren, but there are yet immense areas of fertile soil awaiting cultivation. Much has been done in the past decade towards the settlement of Western Canada, as witness the many millions of bushels of wheat that are grown annually. But still greater strides towards the development of the country are likely to be made during the next ten years.

The prosperity of the people of the West is exhibiting itself in a desire to provide more comfortable homes. Building operations in Manitoba and the Territories are each year showing an improvement both in volume and character.

The importance of the West as a lumber market is more fully recognized to-day than ever before. It is a most significant fact that, in the face of adverse circumstances, Canadian manufacturers have been able during the past year to greatly limit the amount of lumber imported from the United States. The Dominion Government has in many ways shown its desire to develop the western country, but still leaves the lumber market open to American competition. This market is supplied largely by British Columbia manufacturers, who, owing to location, are obliged to import most of their machinery and mill supplies from the United States and pay a duty thereon. Their lumber is also taxed when shipped to the United States, but the American manufacturer contributed not a cent to the Dominion treasury when supplying the Canadian consumer. A readjustment of the tariff law would greatly assist the lumber industry of the West.

The lumber industry of British Columbia continues to grow rapidly. Saw mills with a daily capacity of over one hundred thousand feet of lumber, and shingle mills turning out daily one million shingles, are sufficient proof of advancement. But a still greater development of the lumber business of the Pacific Coast is looked for, and the time when lumber and manufactures of wood from Canadian establishments will be more extensively in demand in the markets of South Africa, Australia, China, Japan, and other eastern countries, is fully anticipated. The export trade in lumber, as in other commodities, is bound to expand, and with the settlement of Manitoba and the Territories which is now taking place at such a rapid rate, the lumber industry of the West should become a more important factor in the commerce of the Dominion.

Mr. Harrison Watson, Curator of the Canadian Section of the Imperial Institute, in making his annual report for 1901, refers as follows to the demand for timber and manufactures of wood:—

"There continue to reach this office numerous enquiries for the names of Canadian mills which can supply such lines as doors, mouldings, flooring, blocks, handles, seats, chairstocks, etc., and on the other side application from Canadian manufacturers and shippers for information as to demand for above and similar goods over here. These industries appear to be gradually developing, but apparently the supply of goods is not increasing in the same ratio as the demand, for the usual report of visitors to the Dominion in search of supplies is that practically all the concerns which are really in a position to deal with export trade have already contracted for all they can possibly produce. There are some lines, such as box shooks for example, where competition keeps prices down to levels which would be unprofitable to Canadian shippers; but, on the whole, there would seem to exist a profitable field for further investment in the wood-working and turning industry which deserves the attention of Canadian capitalists. Attention has already been called to the advantages which the maritime Provinces offer for the erection of such establishments where export trade is the main consideration, owing to their proximity to European markets and the possession of open harbours throughout the year. Merchants on this side often express their surprise that more has not been accomplished in this part of the Dominion. Among other

enquiries one worthy of note has been as to the suitability of Canadian sleepers or ties for railways in South Africa and other semi-tropical countries.

"From time to time letters are received from Canadian firms for information as to the demand for wood skewers, and expressing the opinion that they are well equipped for supplying same. From enquiries made it would, however, appear that only one Canadian maker does any trade of any account in this market, and it is therefore probable that my Canadian correspondents find, after due investigation, that they are unable to compete in price with the skewers produced by the special machinery of the American corporation. Another point is that most Canadian skewers are of maple, whereas until recently hickory skewers were practically the only variety used, and even now a large section of the trade maintains its conservative preference and will not use maple."

BRITISH TRADE METHODS ABROAD.

In his recent report on the trade of Bordeaux for 1901, H.M. Consul makes the following observations with regard to British trade methods in foreign countries. He notices that the preponderance of enquiries from commercial houses to Consular officers relates to sellers and not to buyers; thus, so far as this is concerned, a Consul's aid to the increase of his country's trade is rather of a negative order. It would indeed appear that the Consul is generally appealed to by those firms who are engaged in cutting down British trade as much as possible, by encouraging importation from abroad, and foreign competition in British manufactures. It would be much more satisfactory if the majority of enquiries were for names of buyers. The enquiries from the colonies are very few, and it may be well to state that all enquiries on commercial subjects from all parts of the empire receive the fullest attention. Consular officers would be in a much better position to help British manufacturers if the various manufacturing towns and centres would furnish them with directories and trade lists, to which they could refer on being applied to by the local traders. At present, without any of these guides, it is usually necessary to refer the enquirer to his own Consular representative in the United Kingdom. On the subject of directories, he mentions that he constantly receives notices from lottery agents in all parts of Europe addressed in full to his private residence, which proves that these agents find it pays to supply themselves with directories of all the principal cities in Europe, so that they may be able to send their advertisements to every householder. Surely commercial houses might well adopt this system, and by the aid of directories address their circulars, price lists, catalogues, or enquiries direct to the firms interested in their branches of trade. The *Annuaire Didot-Bottin*, published at Paris, contains the names and addresses of all the commercial houses in France, under their various trades in each town, and, no doubt, similar directories are to be found for each country. These directories are widely known, and they are mentioned for the benefit of those who may not have access to them. He again states, however, that all enquiries addressed to his Consulate, from persons interested in various branches of trade, always receive full attention and a prompt reply.

It should, however, be borne in mind, that a Consular officer is bound to exercise discretion in the manner in which he imparts information to commercial houses. While believing in free trade, he should at the same time support fair trade. There are in most large continental cities, British merchants who have established themselves at great expense and trouble, for the purpose of engaging in some branch of trade, which in many instances they have themselves created between their port and the United Kingdom, and which, by their energy and foresight, has assumed great importance. In the course of time, the number of British houses engaged in this particular trade has very likely increased, so that there is considerable local competition, which is, as a rule, as much as the trade will bear. The Consul at that port is probably in possession of full information on all points of this particular trade, and he should be most discreet in his use of this information, lest it be used by competitors at home, who have not incurred the risks, expenses and responsibilities of the local houses, to the detriment and loss of those, who, by their prevision and resolution, have acquired the right to a primary interest in the trades they have created, and in which they have embarked their capital. These British houses, having established their business on a firm footing, are a sure stay of and channel for British trade, whereas, if the competition of irresponsible traders is so strong that they are obliged to close their houses and place their capital elsewhere, their businesses will probably be taken up by natives of the places, who, in order to succeed at all, and having no British interests, remove their orders to the cheapest markets they can find.

"Consular officers are, to all intents and purposes, the scouts of the commercial forces of their nations at the world's immense commercial seat of war, and the information they obtain should be used for the general good of their country and not to allow one division to steal a march on another. They are the intelligence agents of their country in the peaceful rivalry of nations, and not the spies of individual contingents. These latter are to be found in the commercial travellers of individual firms, who push forward their wares in advance of friends and foes alike, and highly necessary are they in the war of commerce. It is no use to suppose that Consular and commercial agents do away with the necessity for private travellers. On the contrary, the more commercial intelligence is gathered and imparted by the former, the greater necessity there is for the latter to grasp the situation and endeavour to take possession of it. Commerce does not allow of laying siege or being besieged; some countries throw up all manner of ramparts and entrenchments in the form of protective duties to keep out competition, but the cry of commerce is always "Onward! forward!" and in the long run those countries will be left to face starvation by themselves unless they open their gates and act on the offensive. To act only on the defensive, brings no increase to trade or commercial prosperity, as already remarked in a former report, and it is necessary for the growth and success of commerce to carry the war vigorously into the enemy's country. This can only be done by systematic pushing, and proving that the manufactures offered, no matter of what kind, are, so to speak, the stronger and better, and it is to those who make the strongest attack and fight with the greatest energy, that the victory will remain. For the manufacturers of the United Kingdom to remain within their frontier shores, resting on their laurels, easily won in bygone days, while competing armies of foreign manufacturers are pushing forward and endeavouring to gain ground in all directions, means nothing but defeat and loss of what has been gained.

"It is true that there is room in the world for all commerce, as it is true that at the present there is room for all nations, but the United Kingdom would not be the great nation she has become if her sons had been content to remain shut up in their island home, and had not pushed forward in advance of all others, and laid the solid foundations of the Empire in all quarters of the globe. It is, therefore, absolutely necessary that commercial men should be educated and trained to perfection in their art, that they should be fitted, by learning the languages, habits, and requirements of foreign nations, to become units of the invading friendly armies which are carrying British commerce to the fore in all countries, and it is equally necessary for them to keep watch, to be on the alert, and ready to advance whenever there is an opening, in order that they be not overmatched, obliged to retreat, or surrounded by the ever-increasing hoards of competitors under foreign flags that are incessantly pushing forward with the object of outmatching and outflanking them. With the world being opened up at the present rate there is no time for loitering or resting; British trade must march on rapidly, and be foremost in the work of civilisation."

JAPAN'S FOREIGN TRADE.

A Japanese view of the commerce of that country is presented in a publication recently issued by the Washington Treasury Bureau of Statistics, entitled, "The Foreign Trade of Japan," forwarded by a distinguished Japanese official. "The foreign trade of Japan," it says, "is progressing year after year, owing to the rapid development of her agriculture, commerce, industry, and navigation. In 1901 the total value of imports and exports amounted to 247,300,000 dols. in the aggregate. This amount is twelve times larger than that of thirty years ago, eight times larger than that of 1881, and $3\frac{1}{2}$ times larger than that of 1901. This is all the more remarkable, since it owes but little to the increase in population, which is little over 10 per cent. in every decade. It scarcely need be said that the continent of Asia holds the most intimate relations with the foreign trade of Japan. The total value of articles exported to that continent amounts to over two-fifths of the total imports of Japan, and the value of articles imported from Asia into Japan amounts likewise to over two-fifths of her total imports. The amount of exports to America scarcely reaches one-third, and that to Europe is only one-fifth of the total exports, while the import from America into Japan is little short of one-fifth, and that from Europe is nearly two-fifths of the total imports. Imports and exports in the case of Asia, however, include those from and to Hong Kong, which have naturally a character of 'transit,' and, consequently, if proper allowance be made for Hong Kong trade, we may safely say that the products of Japan are equally distributed in Asia, Europe, and America, and imports from Europe to Japan are nearly equal to those from Asia. Of the exports to Great Britain, though the return of the trade does not indicate any remarkable increase, it must be remembered that the exports to Hong Kong are in many instances re-exported to Great Britain. The articles of which Japan demands the supply from foreign countries are mainly machineries of various sorts, iron, petroleum, sugar, cotton, tissues, woollen fabrics, and some others. The largest items of import in the matter of machineries are spinning machineries, mining machineries, locomotive engine and metal working machineries. Iron and steel are chiefly imported from Great Britain, the United States, Germany, and Belgium. The demand for most of the articles enumerated above is due to the recent rapid progress of our industries, and to sudden advancement of the standard of living among the people at large. However, it is now expected that most of these articles, with the exception of wool, will be manufactured or produced in Japan. On the whole the trend of Japan's foreign trade is promising; the imports will in future increase in raw materials, and decrease in manufactured articles."

CITY BRANCH OF THE IMPERIAL INSTITUTE, AT 49, EASTCHEAP, LONDON, E.C.

The CITY BRANCH OF THE IMPERIAL INSTITUTE embraces:—

A SAMPLE ROOM for the display of raw and manufactured products from the Colonies and India, for which it is desired to find openings in markets at home and abroad.

AN INFORMATION OFFICE where enquiries relating to industrial, commercial and other matters connected with the Colonies, India and Foreign Countries are received and promptly dealt with.

A NEWS ROOM supplied with:—

- (a) Hand-books and directories of the British Empire, including many pamphlets (for free distribution) dealing with Canada, the Australian States, New Zealand and South Africa.
- (b) The chief trade papers of Great Britain, the Colonies and India.
- (c) Many commercial periodicals of the United States, Germany, France, Austria, etc.
- (d) Market reports, prices-current, official reports and statistics.

The City Branch is in constant communication, by telephone and messengers, with the Imperial Institute, South Kensington. Curators and other members of the Imperial Institute staff will attend at the office at stated times and by special appointment, to deal with enquiries and to assist in establishing or facilitating business relations with mercantile houses, etc., in the Colonies and in India.

1. The Sample Room is open free to the public, by introduction.
2. The News Room is *free to Fellows* of the Institute, as is also the Enquiry Office for the supply of such information as does not involve special research or correspondence.
3. A *subscription* of the sum of one pound per annum, payable in advance, secures the *free use* of the News Room, and the supply, free of charge, of information not involving special research or correspondence.
4. Subscribers of one pound per annum are also entitled, on presentation of their members' tickets, to inspect, *free of charge*, any maps or charts, included in the Map Room collection at the Imperial Institute, South Kensington, or to consult any works, or official papers, included in the Institute Library.

5. *Non-Subscribers* to the City Branch can be supplied with information upon the following terms:—

- (a) *First* enquiry, not involving special research or correspondence, *free*.
- (b) For each subsequent enquiry, not involving special research or correspondence, *one shilling*.
- (c) For each enquiry, involving special correspondence, or reference to home-experts, etc., *five shillings*.
- (d) For each enquiry involving Colonial or Foreign correspondence, *ten shillings*, or by special arrangement, if likely to be voluminous.

6. *Subscribers* will have to pay the charges specified under (c) and (d) in the foregoing clause, and *Fellows* will have to reimburse the Institute any out-of-pocket expenses incurred in connection with enquiries coming under those heads.

7. The Information Office will undertake to obtain analytical or other examinations of samples by competent Experts, upon payment, by persons submitting them, of the usual professional fees, to be previously specified, and agreed to by the applicant.

8. The Institute will undertake the supply, at cost price, of translations, into any language, of trade circulars, prices-current, etc., the conversion of weights, measures, coinages, etc.

MONTHLY COMMERCIAL AND INDUSTRIAL SUMMARIES.

GENERAL COMMERCE AND INDUSTRY.

UNITED KINGDOM.

Fishery Statistics.—According to the monthly fishery return issued by the Board of Trade, the total quantity and value of all the fish, except shell fish, landed from the fishing grounds on the coasts of England and Wales during the month of June amounted to 652,454 cwt., value £451,582. As compared with the return for June 1901, this shows an increase of 5,188 cwt. in quantity, but a decrease of £45,592 in estimated value. Of this total, 16,482 cwt. of the value of £62,065 were classed as prime fish, being 897 cwt. and £11,701 less than the corresponding figures of June, 1901.

For the six expired months of the present year, the total quantity and value of all kinds of fish, except shell fish, is given at 3,709,250 cwt. and £2,996,740, being an increase of 252,916 cwt. in quantity, but a decrease of £28,904 as compared with last year's corresponding return. If to this be added £143,312 on account of shell fish, the total value of all the fish taken so far this year amounts to £3,140,052, and shows a decrease of £51,892 as against last year's corresponding total.

COLONIES.

Bermuda.—**OPENING FOR CAPITAL.**—The Colonial Office report points out that there is no organized fishing industry in the colony though the waters abound with fish, and discusses the prospects of an organization with sufficient capital if such embarked upon the business. Attention might also be given to the cultivation of lobsters, oysters, scallops, etc. An important industry in Bermuda is the cultivation of lily bulbs for export. At present the large extension works at the dockyard is leading to the immigration of a considerable number of labourers.

Jamaica.—**TAX ON TRAVELLERS ABOLISHED.**—An Act abolishing the tax of £22. 10s. on commercial travellers dealing in spirits, and of £12. 10s. on those not dealing in spirits, was passed in the last session of the Jamaica Legislature, and received the assent of the Governor. During the existence of this law it is said that many salesmen arrived in the island intending to transact business, but, owing to what they considered an excessive tax for a stay of a week or a fortnight, they left without selling any of their wares.

South Africa.—**CODE AND CIPHER AVAILABLE.**—The Postmaster-General announces that the restrictions on telegrams in code and cipher to and from Rhodesia, British Central Africa, Orange River Colony, Transvaal, Cape Colony, Natal, and St. Helena have now been withdrawn.

Trinidad.—**PETROLEUM.**—A petroleum oilfield has been discovered in Trinidad. The quantity is apparently large, and, according to Reuter's correspondent in Port of Spain, important developments are anticipated.

Western Australia.—**INDUSTRIAL PROGRESS.**—The Governor, in a recent speech, called attention to the steady advance that had taken place in West Australian industries. Immigration had increased, while mining and agriculture had steadily progressed, and the Government was determined to offer every encouragement for the development of both industries. It was gratifying that the pastoral industry of Western Australia had not suffered from the disastrous drought experienced in the sister State. The Coolgardie water scheme had been successfully tested as far as Cunderdin, and water was now being supplied to Northam, Meckering, and Cunderdin, and to the railway department. Over 208 miles of pipes had been laid down, and the water was expected to reach Coolgardie in December next. The revenue—the most satisfactory for years—amounted to £3,688,049 and the expenditure to £3,490,025, leaving a surplus of £123,185 after deducting a deficit of £74,839 with which the year started. The loan money in hand, together with the balance of the authorizations, was estimated to be sufficient to carry on the works until January next. Parliament would be asked to grant further authorizations for extending the water supply and for the construction of a dock at Fremantle.

COAL-MINING.—The preliminary report of the Department of Mines forecasts the removal of certain drawbacks which last year hindered the development of the Colliery coalfield, and states that with the advent of coal-cutting machinery and the consequent cheapening of production, a prosperous future is assured. The output of the coalfield in 1901 was 117,836 tons, being 574 tons less than in 1900. Several causes have contributed to this result, one being a fire at one of the main producing collieries, the Wallsend, which materially reduced its output, while another was the non-production of coal from the West Colliery mine for the latter part of the year, the seam that was being mined proving unprofitable. Another reason for the want of progress during the year is to be found in the inadequate supply of trucks for coal-carrying purposes, which has resulted in the companies being unable to supply small consumers in Perth and Fremantle. The value of the output shows a substantial increase on the previous year, notwithstanding the diminished weight. For 1901 the total value was £68,561, as against only £54,835 for the previous year.

West Indies.—**SUGAR INDUSTRY.**—It is announced in the Government Gazette that the Imperial Government has placed £10,000 at the disposal of the Colonial Government to enable it to make advances to the sugar estates in order to ensure the continuance of cultivation and the payment of an adequate rate of wages to the labourers pending the coming into operation of the Brussels Convention in September, 1903. The advances are to be made at 6 per cent.

A direct service of fruit steamers between the West Indies and Manchester, belonging to Messrs. Elder and Fyffes (Limited), was inaugurated on the 28th ult., so far as concerns Manchester. The *Chichahoming*, the first steamer of the service, reached the Ship Canal docks on Sunday night, bringing 30,000 bunches of bananas from Jamaica.

INDIA.

The Marking of Yarns in India.—A decision of considerable importance commercially has just been issued by the Government of India. In February last the India Office was asked to ascertain the views of English spinners on the marking of woollen yarns imported from the Continent into India. As the result of a reference to the Association of Chambers of Commerce of the United Kingdom, the Indian Government approves the application of the metric system of marking to both silk and woollen yarns in India, provided that the manufacturers follow the metric system in full, qualifying the marks with the words "Continental count" or "metric system of count," and give the country of origin of the yarns, and provided also that yarns marked in accordance with the British system are admitted freely as hitherto.

FOREIGN COUNTRIES.

German Trade.—The Imperial Statistical Department has recently published reports upon the trade of the German Empire with Italy, Switzerland, Belgium, Roumania, and Serbia during 1901. Imports from ITALY amounted in 1901 to 182,000,000 marks (£9,100,000) with precious metals, and 177,000,000 marks (£8,850,000) without precious metals, and exports to Italy with and without precious metals were 127,000,000 marks (£6,350,000) and 123,000,000 marks (£6,150,000) respectively. The imports decreased by 2 and 1·7 per cent. with and without precious metals respectively; the exports, with precious metals, decreased 0·1 per cent. and without precious metals increased 0·2 per cent. The principal imports from Italy were silk, eggs, fruit, sulphur, marble, and asphalt; the principal exports, machines and ironware. Imports from SWITZERLAND attained in 1901 a value of 150,000,000 marks (£7,500,000) with and 148,000,000 marks (£7,400,000) without precious metals. The imports decreased by 9·6 and 8·9 per cent., and the exports by 9·5 and 9·4 per cent. The chief articles of import were raw silk, watches, cotton goods, and cheese; and of export, combustibles, ironware, clothes, and woollen cloth. The value of imports from BELGIUM was 186,000,000 marks (£9,300,000) and the value of exports 236,000,000 marks (£11,800,000). The decrease of 15·4 per cent. in imports and 6·8 per cent. in exports is partly accounted for by an improvement in the statistical tables, which formerly included figures relating to goods not actually forming part of the trade between Belgium and Germany. The imports included wool, horses, coal, and zinc, and the exports, machines and ironware. Trade with ROUMANIA increased in consequence of a better harvest, the imports and exports by 33·1 per cent. and 33·9 per cent. respectively (without precious metals by 38·1 per cent. and 36·2 per cent.). The chief import was grain and the chief exports were cotton and woollen goods and gold coin. The imports amounted to 47,000,000 marks (£2,350,000) and the exports to 34,000,000 marks (£1,700,000). The imports from SERBIA, 7,500,000 marks (£375,000), decreased by 20 per cent., the exports, 7,200,000 marks (£360,000), by 18 per cent. Dried plums formed the principal import, though the amount imported was much less than in 1900, and firearms the principal export.

Wastes and By-Products.—The following extracts are taken from a report by Henry T. Ketttridge to the Director of the Census of the United States upon the utilization of wastes and by-products in manufactures:—

"The refuse of cities throughout the civilized world is now generally collected and disposed of for sanitary reasons, though in many instances it is utilized to good advantage for industrial purposes. The collection of this refuse has been made only within a comparatively few years, but is now carried on systematically, being more or less self-supporting and advantageous from an industrial point of view. Formerly this refuse was simply accumulated and disposed of by burning or casting into streams or on to waste land. Now bones, glass, rags, iron, paper and other articles are separately collected and sold. Old tin cans are used (1) for the recovery of solder, (2) for the recovery of the tin, and (3) for remelting in the manufacture of steel or iron. The waste heat from furnaces, into which the inflammable refuse is thrown, may be utilized for steam purposes in operating engines for electric lighting and power. The city of Glasgow, Scotland, obtains waste heat from such furnaces equivalent to nearly 9,000 horse-power per day of ten hours for power for manufacturing purposes.

"FOOD WASTES.

"The food wastes of New York city are disposed of by what is known as the Arnold utilization process, which is, briefly, steam digestion and a separation of the cooked product into greases and fertilizer fillers. The greases are all, or nearly all, shipped abroad, and, it is believed, refined and separated into several grades, such as 'glycerine, red oil, lard oil, and inferior grades.' It is not known that refineries in this country are as yet able to handle what is known as garbage grease, as the secret of the trade seems to be held abroad. The solids, after being dried and screened, are sold to the various manufacturers of 'complete fertilizers,' and by them made up into grades which seem to be particularly adapted for use in the cotton belt.

"FURNACE SLAG.

"The economic uses of furnace slag have been greatly developed within the last few years. Formerly this slag was carted away from the furnace and disposed of in the most available place as so much refuse material, hardly worth the cost of carting. It was considered an encumbrance of the smelting works, of no account except to fill up gullies and ravines, or to be thrown into the sea, if such a disposition could be made of it. Within very recent years it was estimated that the cost of removing this waste slag from the furnaces of England was no less than \$2,500,000 annually. The amount of slag made by the iron furnaces of Great Britain is certainly immense. A considerable portion of this waste is now put to some profitable use as a substitute for artificial porphyry in the construction of buildings and for street pavements. Paving stones are made from it for the streets of Metz, Brussels and Paris of a quality sufficiently durable to stand heavy traffic.

"WASTE GASES.

"A very important innovation in the metallurgical industry in Germany is the utilizing of the waste gases of blast furnaces for working gas engines. That the waste gases can now be made serviceable in their entire heating capacity by a rational burning in gas engines is one of the most important steps that have been recently made in science in its adaptations to practical techniques. What this improvement means economically is seen by a theoretic calculation, according to which this use yields a profit of \$1.25 per ton of pig-iron production, which means for Germany alone, where the utilization of these waste gases is made, a gain of over \$10,000,000 on her entire wrought-iron production.

"Gas engines for utilizing these gases were introduced into Germany about 1898. Good results were reported from all quarters, which lead to the belief that this is a material advance in the development of an important gas-machine industry.

"LUMBER AND TIMBER.

"Nearly all of the formerly waste products of lumber and timber are now turned to some utility, and some of the new products thus formed are of considerable value. Of this latter class may be mentioned sawdust, which was formerly considered an absolute waste material, and was allowed to float down the stream or was thrown into a heap where it could be most conveniently disposed of.

"The production of acetic acid, wood naphtha and tar from sawdust is one of the latest enterprises in Norway. A factory has been started at Frederikstad capable of distilling 10,000 tons of sawdust in a year. It also manufactures charcoal briquettes, which are exported to the Netherlands. The acids are chiefly placed on the German markets, while the tar is mostly consumed at home. The factory is said to be the first of its kind erected in that country. According to an English patent of 1897 sawdust may be so prepared as to be non-inflammable, and then applied to jacketing of boilers and other purposes."

LABOUR MARKET.

COLONIES.

The monthly report, compiled by the EMIGRANTS' INFORMATION OFFICE, 31, Broadway, Westminster:—**Canada.**—There has been plenty of work in the building trades, in the lumbering and allied industries, and in agriculture. There has been a marked increase in the wages of masons, bricklayers, and others in the building trades, of moulders, pattern-workers and iron-workers generally, and of railway employes; this increase is largely due to the greater cost of living. There is a good demand in the Montreal district for farm hands, general labourers, and female servants, and for miners in Western Ontario. There is a large demand for general labourers for railway and other work at Sault St. Marie and in the Algoma district: there is also a good demand for carpenters, blacksmiths, and female servants. The Royal Commission appointed in 1900 to enquire into Chinese and Japanese immigration to British Columbia has just reported as to the Chinese, "that the further immigration of Chinese labourers into Canada ought to be prohibited."

Australasia (New South Wales).—The drought continues to be very serious. Operations at the mines have been restricted from want of water, and enormous losses of sheep have occurred. The result is, that a considerable number of miners, shearers, and station hands have been thrown out of work. In spite of this, however, under the new shearing agreement the pay of shearers has been raised generally to 20s. per 100 sheep shorn. The price of provisions has risen almost everywhere. (**Victoria.**)—The drought is very serious, and restricts agricultural, pastoral, and mining operations. There is practically no demand for more labour of any kind, and many men are out of work; no large public works are being contemplated by Government which might provide employment. The rise in the cost of rent, and of meat, bread, and other articles affects everyone. The Woollen Trade Board has fixed the lowest wages to be paid to wool-sourers and spinners at 30s. a week, and to female warpers at 15s. (**Queensland.**)—The last report from the Government Labour Bureau shows that in the North there was no demand for anyone, except female servants and a few general labourers; that in the Central districts there was practically no demand for anyone; and that in the South there was a good demand for agricultural labourers and general labourers only. More mechanics, station hands, miners, or married couples on farms and stations were not wanted in any part of Queensland. The drought is causing great losses. (**Western Australia.**)—There is practically no demand for more labour at the present time, except for competent farm hands and female servants. (**New Zealand.**)—A report from Auckland states that there is a demand for farm and general labourers, station hands, mechanics, and female servants, but not for miners. A report from Hawkes Bay states that there is a good demand for female servants, but not for any mechanics or labourers, unless they are specially skilled.

South Africa.—There is a good demand for competent mechanics, especially those in the building trades, in Cape Colony, Natal, the Transvaal and Orange River Colony; but no one can land without a permit, which must be obtained from the Permit Office, 47, Victoria Street, London, S.W. No more applications from railwaymen for service in Cape Colony or Natal are now wanted. The Agent-General for Natal will still entertain a few applications from boilermakers, riveters, platelayers, signalmen, and carriage and wagon examiners; he is instructed to suspend the granting of passages to carpenters and other artisans, and those who go must find their own way out. Candidates for the Cape Mounted Rifles must apply to the Agent-General for the Cape of Good Hope, at 100, Victoria-street, S.W., and candidates for the South African Constabulary in the Orange River Colony and Transvaal, to the Recruiting Officer, King's-court, Westminster, S.W.

Western Australia.—**LABOUR LEGISLATION.**—The *Labour Gazette* gives an account of the new laws relating to Labour in Western Australia, which have recently received Royal Assent. There are four Acts dealing respectively with Trade Unions, Conciliation and Arbitration in Industrial Disputes, Workmen's Compensation, and Shop Hours Regulation. The Trade Unions Act follows closely the lines of the legislation in force with respect to this subject in the United Kingdom. The Industrial Conciliation Act, which repeals the previous Act of 1900, is, in the main, identical with the Industrial Conciliation and Arbitration Act, 1900, of New Zealand, but in certain respects follows the recent statute passed by New South Wales. This Act provides for the establishment of District Boards of Conciliation, and also of Special Boards, to meet any case of emergency or any special case of industrial dispute, and of a Court of Arbitration, power being given to either party to a dispute to refer the matter direct to that Court, without taking it in the first instance before a Board of Conciliation, and for the making of industrial agreements. With respect to strikes and lock-outs, the Act sets out penalties for those who are associated with a strike or who, pending reference to a Court, suspend work in any industry. The Workers' Compensation Act applies to injuries of workers employed on or in or about any railway, waterwork, tramway, electric lighting work, factory, mine, quarry, or engineering or building work, or on or in or about any employment declared by proclamation (issued pursuant to addresses from both Houses of Parliament) to be dangerous or injurious to health or dangerous to life or limb.

FOREIGN COUNTRIES.

Germany.—**FACTORIES REPORT.**—The yearly report of the official inspectors on the state of labour in Berlin and its suburbs of Charlottenburg, Schöneburg, and Rixdorf, gives the total number of persons employed in factories and workshops within this area during 1901 as 233,762, or about one-tenth of all the persons so employed in Prussia. This total includes 152,851 men, 66,440 women, 14,424 young persons of 14 to 16 years of age, and 47 children. Of the women, 23,035 are from 16 to 21 years old, and 43,405 over 21 years old. The total number of these employed in factories and workshops only increased by 1·9 per cent. during 1901, as against 10·5 per cent. in the preceding year. The number of male workers decreased by 1·3 per cent., but there was an increase of 10·1 per cent. in the number of females employed. The dulness of trade has thrown many people out of work. Enquiries made by the inspectors in 1,233 establishments showed that in the metal and machine industries, the building, carpentering and allied trades, there was a decrease of from 15,000 to 18,000 in the number of persons employed in October, 1901, as compared with October, 1900. The iron foundries dispensed with about 39 per cent. of their hands. It was calculated that in the month of November about 7,500 factory hands were out of work. Many firms have curtailed the hours of work. The workmen in the machine factories, for example, have earned on an average 15 per cent. less than usual. One consequence of the slackness in the labour market has been to render the housing question, especially in northern and eastern quarters, less acute, since many persons have left Berlin in hope of finding employment elsewhere. The complaint, however, is made that the suburb of Charlottenburg, which is largely inhabited by the well-to-do classes, puts difficulties in the way of the erection of industrial dwellings.

EMIGRATION AND IMMIGRATION.

* * *The Imperial Institute acts in concert with the Emigrants' Information Office (which is under the direction of the Colonial Office), of 31, Broadway, Westminster, S.W.; and also with the British Women's Emigration Association, now temporarily carrying on its work in rooms at the Institute. The Handbooks and Quarterly Circulars issued by the Emigrants' Information Office may be obtained at the Commercial Intelligence Office. Special information and practical advice respecting Canada and Cape Colony will also be furnished by the Curators of these Sections.*

UNITED KINGDOM.

General Emigration.—The emigration returns from ports of the United Kingdom for the first six months of the present year to June 30 last show that there is a marked difference in the emigration movement from this country to the different parts of the world, as compared with previous years. Australasia, for instance, is credited with 787 fewer immigrants than during the first six months of 1901. The United States shows a decrease of 2,481, while Canada shows an increase of 6,578, or more than 50 per cent., and South Africa has an increase of 7,001, or over 70 per cent. A feature in the returns for the first six months of the present year is the marked difference shown in the movement towards the United States and British North America. That there should be a reduction, however slight, in the emigration to the United States, and such a wonderful increase towards Canada, is indicative that at last a change seems to have come whereby a proper appreciation of the advantages offered by Canada is beginning to be understood.

The British Women's Emigration Association.—The hon. sec. reports 530 applications received in the past month. 77 persons sailed, viz.:—35 to Canada, 40 to South Africa, 1 to Australia, and 1 to New York. Many applications from employers in the colonies are received, showing that the persons already sent out by the Association are giving satisfaction in their new surroundings.

At a meeting on "Emigration," held at the Exhibition at Portsmouth on July 19, by the South African Expansion Committee of the Association, the need of increasing the number of the British population in the newly-acquired territories was dwelt upon. Assistance towards this is given by the Home Government granting indulgence passages to Cape Town in the transports now going out to bring home the troops which have been so long on active service. The passages are granted to women recommended by the Association, but only those are eligible whose relations are ready to receive them, or who have employment to go to on arrival. Their application forms, obtainable from this office, and their other papers, must be in readiness, as these assisted passages are always offered at short notice. It cannot be too often emphasized that only adaptable, capable, and reliable women are wanted in the new countries; such as these will find themselves valued, and be able to make themselves and others contented amid the strange and often, at first, uncomfortable circumstances, of their new home up country, out of reach of all the modern conveniences of civilization.

Some previous experience of domestic work is insisted upon as essential to all women-settlers, and many opportunities for acquiring this systematically are offered in this country.

Among the following list of Schools of Domestic Economy some have arranged a special course of Colonial Training. Details as to subjects and terms, and the addresses and other particulars of either of them, can be obtained at this office. A full account of this subject will shortly be published in *The Imperial Colonist*. The County Councils' technical schools at Ipswich; in Yorkshire, Hampshire, at old Basing; Sussex, at Lewes; at Cardiff, the University College of South Wales; cookery and other classes in London, Edinburgh, Liverpool, Bristol, Gloucester, Newcastle, Cheltenham, and Dorchester; training at Raith, near Kircaldy in Scotland, at "Leaton," Wellington, Shropshire; at West Malvern; at Zeals, Bath; at St. Margarets-on-Thames. By Miss Orr, at Aldborough, Yorks; Miss Mitchell, Temple Ewell, Dover; Mrs. Tritton Gurney at Haslemere, Surrey; and Miss Lewis, Wightwick, near Wolverhampton. Ladies may obtain special training as children's nurses at the Norland Institute, London, and Sesame House, St. John's Wood; at Manchester, and at Liverpool. More facilities for training after arrival in the colonies would be desirable.

The British Women's Hostel in London, for which an appeal for funds was issued some months ago, is now fairly started. It has been badly needed, and will be of great use to the women travellers who need a place to stop at in London. A good house has been bought by the British Women's Emigration Association, 22, Upper Westbourne Terrace, Paddington. About 30 beds can be made up. The purchase money has been advanced by members of the Association and their friends, and besides these loans and the guarantee fund of £400, more than £500 has been collected to start with. Lady Brassey has made a very liberal present of furniture and linen. A lady resident matron has been appointed, and it is hoped that the house will be ready to receive some passengers for Australia, sailing on July 31 and August 1.

A full list of the subscriptions will be published.

COLONIES.

The July circulars of the Emigrants' Information Office and the annual editions of the penny handbooks show the present prospects of emigration. The notice boards are now exhibited, and the circulars may be obtained free of charge, at more than 900 public libraries, Urban District Councils and institutions throughout the country.

This is the best season of the year for emigrants to go to **Canada**. There is a good demand for capable men and boys who understand farm work, looking after cattle, horses, and sheep, milking cows, etc. Even inexperienced hands may get places, provided they are willing to learn and are strong; their wages at first will be nominal, but board and lodging will be supplied free. As a rule single men are preferred everywhere, but married men with wives competent to take charge of dairy or laundry, and families able to work, have no difficulty in obtaining employment. Female servants also are in great demand on farms and in towns. Speaking generally, mechanics and labourers are well employed at this time both in towns and in country districts.

In **New South Wales** trade continues fairly busy both in building and construction work. Shipping has fallen off, and some wharf labourers have been thrown out of employment. Coal-miners are generally well employed. The labouring classes generally are complaining of the increased cost of living owing to the new federal tariff.

In **Victoria** there is no general demand for more labour. The drought continues to press heavily on large portions of the State, and seriously affects pastoral, agricultural and mining industries; in some country districts, however, good rains have fallen, and competent farm labourers and milking hands are very scarce.

In **South Australia** and **Tasmania** the local labour is sufficient.

There is a good demand for farm labourers in the South of **Queensland** and in **Western Australia**, but more miners are not wanted in either colony.

In **New Zealand** competent general labourers find good employment, but more are not wanted during the present winter season.

Canada.—**ENORMOUS DEMAND FOR BRITISH LABOUR.**—The Dominion's record wheat crop is causing an enormous demand for labour. The Dominion authorities have made extensive arrangements for sending out labourers from this side to assist in gathering the harvest. Canada's reaping operations extend from August to October, and the threshing of the grain from October to December. All this time the imported labourer will be paid from £6 to £8 per month, with board and lodging. The steamship lines and the Grand Trunk and Canadian Pacific Railway Companies are arranging special passenger fares for harvest men, of whom it is hoped a large number will settle in the country. To every such settler half his steamboat and railway fare will be handed back as a bonus. The Canadian authorities point out that the harvest will enable any strong young fellow, and there are plenty of them returning from South Africa, to go out to the wheat belt of Manitoba to see the country for himself, to pay all his expenses out of his earnings, and at the finish to return home if he so chooses with a balance of £20 in his pocket. The Dominion Commissioner of Immigration at Winnipeg states that the estimated number of extra farm labourers required this summer from the outside to assist in the harvest will be from fifteen to twenty thousand.

CUSTOMS TARIFFS.

UNITED KINGDOM.

Revised Duties on Maize and Maize Meal.—With reference to the revised schedule of corn and grain duties, the Board of Trade have received a further General Order (No. 39 of 1902), issued by the Commissioners of Customs on the 20th June, notifying the reduction of the duty on maize to 1½d. per cwt., and on the meal or milled products of maize (other than offals, which are dutiable at the 1½d. rate) to 2½d. per cwt.

These reductions of duty came into force on the 18th June.

Present Rates of Customs Duties on Spirits.—With reference to the increased import duties on certain articles imported into the United Kingdom, it is to be noted that, according to a General Order (No. 38 of 1902) issued by the Commissioners of Customs on the 19th June, the increase of import duties on spirits does not apply to brandy or rum, nor to liqueurs, cordials, mixtures, etc., entered not to be tested, nor to perfumed spirits.

According to this General Order, the following is a complete list of the duties now payable on spirits:—

Description of Spirits.	Rates of Duty.	
	Imported in casks.	Imported in bottles.
	s. d.	s. d.
Spirits and strong waters.		
For every gallon computed at hydrometer proof of spirits of any description (except perfumed spirits), including naphtha or methyl alcohol purified so as to be potable; and mixtures and preparations containing spirits—		
Enumerated spirits—		
Brandy . . . per proof gall.	11 4	12 4
Rum . . . " " "	11 4	12 4
Imitation rum . . . " "	11 5	12 5
Geneva . . . " " "	11 7	12 7
Unenumerated spirits, sweetened, per proof gall.	11 7	12 7
(Including liqueurs, cordials, mixtures, and other preparations containing spirits; if tested.)		
Unenumerated spirits, not sweetened, per proof gall.	11 5	11 5
(Including liqueurs, cordials, mixtures, and other preparations containing spirits, provided such spirits can be shown to be both unenumerated and not sweetened; if tested.)		
Liqueurs, cordials, mixtures, and other preparations containing spirits, in bottle, entered in such a manner as to show that the strength is not to be tested . . . per liq. gall.	—	16 4
Perfumed spirits . . .	18 1	19 1
Any importations of naphtha or methyl alcohol purified so as to be potable, are rated under the heading of unenumerated spirits.		

COLONIES.

Antigua.—**ADDITIONAL IMPORT DUTY OF 33½ PER CENT.** CONTINUED TO END OF 1902.—The Board of Trade have received, through the Colonial Office, a copy of "The Revenue-in-aid Ordinance (No. 1 of 1902)," by which the additional duty of 33½ per cent. of the amount of duty payable under the provisions of the "Customs Tariff Ordinance (No. 8 of 1901)," is continued to the 31st December, 1902, and thenceforward to the next meeting of the Legislative Council.

Australian Commonwealth.—**IMPORTATION OF PIECE-GOODS FOR USE IN THE MANUFACTURE OF WATERPROOF CLOTH.**—A by-law having relation to the duty payable on piece-goods when imported into the Commonwealth for use in the manufacture of waterproof cloth, was issued by the Australian Commonwealth Department of Trade and Customs on 19th May, 1902, to the following effect:—

"Piece-goods may be delivered at a duty of 7½ per cent. *ad valorem* for the purpose of being manufactured into cloth made waterproof with indiarubber; provided that the Collector is first satisfied that such piece-goods are intended to be forthwith used in the manufacture of waterproof cloth, and that security to the satisfaction of the Collector is also first furnished to the Collector by the importer that the same shall be so used, and that within six months from the date of importation proof shall be given to the satisfaction of the Collector that such piece-goods have been so used by the importer."

Dominion of Canada.—**FREE IMPORTATION OF REFINED COTTONSEED OIL (EDIBLE) FOR CANNING FISH.**—The Board of Trade have received a copy of the *Canada Gazette* for 14th June last, which contains an Order-in-Council, dated 4th June, 1902, providing for the free importation of refined cottonseed oil (edible) for canning fish into the Dominion of Canada from that date.

Natal.—**EXTENSION OF TIME FOR FREE IMPORTATION OF FOREIGN WHEAT, FLOUR, ETC.**—A copy of Act No. 19 of 1902, dated 26th May of the present year, has been received, which extends the provisions of Section 11 of the "Customs Union and Customs Duties Act, 1898," to 30th June, 1903.

[In this section it is provided that flour, wheat, and wheaten meal, including pollard, manufactured from other than South African wheat, and intended for consumption in the Colony of Natal, may be imported free of duty for three years from 3rd January, 1899. The period was extended to the end of 1902 by Act No. 11 of 1901.]

PROHIBITION OF THE IMPORTATION OF HORNED CATTLE FROM CERTAIN COUNTRIES.—A copy of a Proclamation, dated 4th June, 1902 (No. 36 of 1902), has been received, prohibiting, in consequence of the existence of the disease of "Redwater," the importation, directly or indirectly, into the Colony of Natal of horned or polled cattle from the following countries:—

The Colony of Rhodesia; The State of Queensland in the Australian Commonwealth; and The States of Texas and Louisiana in the United States of America.

The Proclamation further provides that "notwithstanding the foregoing prohibition, healthy cattle already shipped for Natal may be allowed to land in Natal, subject to quarantine at such place and for such time as may, in each case, be directed by the district veterinary surgeon at the port."

A further Proclamation, dated 14th June, 1902, prohibits the importation of horned or polled cattle into the colony from any port along the coast of the United States from New Orleans to Charleston, inclusive.

INDIA.

NEW TARIFF ACT. SPECIAL DUTY ON SUGAR IN CERTAIN CASES.—The Board of Trade have received, through the India office, a copy of the "Indian Tariff (Amendment) Act, 1902" (No. 8 of 1902), which was passed at a meeting of the Council of the Governor-General of India on 6th June, 1902, and which provides for the imposition of a special duty, in certain cases, on sugar imported into India.

The present Act amends Section 8 A of the Indian Tariff Act, 1894 (No. 8 of 1894), as amended by the Indian Tariff Amendment Act, 1899 (No. 14 of 1899), by adding the following section:—

"8 B (1) where the rate of duty or other taxation imposed in any country, dependency, or colony upon sugar not produced therein exceeds the rate of duty or other taxation imposed upon sugar produced therein by more than the equivalent of six francs per 100 kilogrammes in the case of refined sugar, or five francs and fifty centimes per 100 kilogrammes in the case of other sugar, then, upon the importation of any sugar from such country, dependency, or colony into British India, whether the same is imported directly from the country of production or otherwise, and whether it is imported in the same condition as when exported from the country of production, or has been changed in condition by manufacture or otherwise, the Governor-General in Council may, by notification in the *Gazette of India*, impose in addition to any other duty or taxation imposed under this Act or any other law for the time being in force, a special duty not exceeding one moiety of such excess."

The present Act will remain in force until the 31st August, 1903, but it will not apply to any imported article or substance, the bill of lading for which was signed and given before the 23rd May, 1902.

A copy of a Customs Circular (No. 10 of 1902), issued by the Government of India under date of the 6th June, 1902, has also been received, imposing, under Section 8 B, sub-Section (1), of the Indian Tariff Act, 1894, as amended by the Indian Tariff (Amendment) Act, 1902 (No. 8 of 1902) (see above), a special duty upon all sugar imported into British India from the undermentioned countries:—

Country.	Rate of Special Duty per Cwt.		
	Rs.	a.	p.
Austria-Hungary	3	3	9
Germany	2	13	9

DECISION RESPECTING THE MARKING OF YARNS IMPORTED FROM THE CONTINENT OF EUROPE.—A copy of a Customs Circular (No. 9 of 1902) has been received relating to the marking of yarns imported into India from the Continent of Europe.

The Government of India have decided, after ascertaining the views of English spinners through the Secretary of State for India, that the Continental description of count will be allowed in the case of both woollen and silk yarns, provided the manufacturers follow the metric system in full, qualifying the marks with the words "Continental count" or "metric system of count," and giving the country of origin of the yarns.

FOREIGN COUNTRIES.

France—Portugal—Congo Free State.—**CONVENTIONAL CONGO-BASIN.**—**TARIFF ALTERATIONS.**—The *Bulletin Officiel* of the Congo Free State for May-June, 1902, contains the text of notes exchanged at Lisbon on the 10th May last between the Belgian Minister at Lisbon (as representing the Government of the Congo Free State) and representatives of the French and of the Portuguese Governments, with the object of fixing the Tariff of import and export duties leviable in the Western Zone of the Conventional Congo-Basin.

The effect of this exchange of notes is to maintain in force until the 2nd July, 1905, the arrangement of the 8th April, 1892. The general *ad valorem* rate of import duties is, however, to be temporarily raised from 6 to 10 per cent., and the duties are eventually to be converted into specific duties at a ratio not exceeding the equivalent of 10 per cent. *ad valorem*. As regards the Congo Free State, this increase is, by a Decree of the King of the Belgians, dated the 28th ult., to take effect from the 20th inst. The export duties are unaffected by this arrangement.

France—Indo-China.—**IMPORTATION OF ARTICLES FROM BOMBAY OR CALCUTTA PROHIBITED.**—The *Journal Officiel de l'Indo-Chine Française* for the 15th May last contains a Decree, issued by the Governor-General of French Indo-China on the 19th April, prohibiting, for sanitary reasons, the direct or indirect importation into ports of the French Protectorate of articles from the ports of Bombay or Calcutta, excepting new raw materials such as jute or cotton in bales compressed by hydraulic power and bound with iron bands.

French Protectorate on Lake Chad.—**TARIFF.**—The *Politique Coloniale* for the 30th June announces the issue of a Decree by the Commissioner-General for the French Congo, imposing the following Tariff of import and export duties in the military territory of the Countries and Protectorates of the Chad:—

Import Duties.—Alcoholic liquors, 180 francs per hectol. of absolute alcohol. Arms, ammunition, gunpowder, and salt, 10 per cent. *ad val.* Ships and boats; steam engines; mechanical apparatus and tools for industrial or agricultural purposes; scientific instruments and instruments of precision; articles for

use in religious worship; articles of clothing and baggage imported for the personal use of travellers or of settlers in the military territory Free.
All other articles 6 per cent. *ad val.*
Export Duties—
Indiarubber and ivory 10 per cent. *ad val.*

Germany.—CUSTOMS DECISIONS.—The Board of Trade have received translations of certain Orders recently issued by the Hamburg Customs authorities, affecting the classification for Tariff purposes of certain articles imported into the German Customs Union. The following is the substance of these Orders:—

Soap-glue ("seifen-leim"), a mixture of "Turkey-red oil" with 24 per cent. of mineral oil and 16 per cent. of resinous oil, is dutiable under No. 29 of the Tariff, as mineral lubricating oil, at the rate of 10 marks per 100 kilograms. (5s. 1d. per cwt.).

Japanese fire-screens and light-shades, made of coloured paper and wood, and intended to stand upright, are dutiable as articles made of paper combined with other materials, under No. 27 f (3) of the Tariff, at the rate of 24 marks per 100 kilograms. (12s. 2d. per cwt.).

Japanese fans, consisting of bamboo cane frames covered with coloured paper, are dutiable according to the nature of the materials of which they are composed, when they are under 15 or over 45 centimetres in length. The length for this purpose, is to be taken as the length of the ribs, or, in the case of immovable fans, of fans opening into a complete circle or ellipse, as the length of a vertical line drawn through the middle of the fan, neglecting the handle.

Lined sheets of paper, consisting of two thin layers of white paper held together by indiarubber, and printed black on both sides, with white lines, are dutiable under No. 27 f (2) of the Tariff, at the rate of 12 marks per 100 kilograms. (6s. 1d. per cwt.).

DUTIES ON YARNS.—The Customs Tariff Committee of the Reichstag has rejected the duties on yarns provided for in Paragraphs 438 to 442 of the Tariff Bill, and voted instead the following reduced rates:—

Para. 438.—Single threaded yarn, raw:

Up to quality No. 22, inclusive (English), 4 marks per double cwt.

From quality No. 23 English to No. 32, 10 marks.

" " " 32 " " 47, 14 "

" " " 48 " " 63, 20 "

" " " 64 " " 83, 24 "

" " " 84 " " 102, 30 "

Higher qualities 36 marks.

Para. 439.—Single threaded yarn, bleached, dyed, or printed: The same duty as on raw single threaded yarns, plus 9 marks per double cwt.

Para. 440.—Yarn of two or more threads. Raw: The same duty as on single threaded raw yarn, plus 3 marks. Bleached, dyed, printed: The same duty as on single threaded yarns, plus 9 marks.

Para. 441 is eliminated, the duties on the sorts mentioned in it being provided for in amended Paragraph 440.

Para. 442.—Yarn of two or more threads, extra twisted. Raw: 36 marks. Bleached, dyed, printed: 42 marks.

Para. 443, fixing a duty of 70 marks on cotton thread, was adopted without amendment.

Germany—Guatemala.—POSTPONEMENT OF EXPIRATION OF TREATY.—With reference to the denunciation of the Commercial Treaty between Germany and Guatemala, it is to be noted that the German *Reichsanzeiger* for the 13th June contains a statement to the effect that the denunciation on the part of Guatemala has been so changed as to defer the expiration of the treaty to the 22nd June, 1904.

Russia—Poland.—PROPOSED INCREASE OF DUTY ON SPUN YARNS.—In his recent report (*Foreign Office, Annual Series 2,810*), H.M. Consul-General at Warsaw writes as follows:—

"I hear on good authority that the duty on all spun yarns, which is now 18 rbls. (£1. 18s. 6d.) per pound (36 lb.), is to be raised by 11 rbls. (24s.) at the end of this year. This will practically shut out all imported yarns. This measure, it is stated, is especially introduced to protect the manufacture in Russia of the higher numbers, that is of yarns over 60's, as the manufacturers complain that they cannot compete with foreign yarns."

With regard to the above it should be noted that up to the present no official confirmation has been obtained.

Salvador.—TARIFF MODIFICATIONS.—According to a Supplement to the Tariff of Salvador, recently published by the International Tariffs Bureau, various Ordinances affecting the application of the Tariff of the Republic were issued by the Salvadorian Government during the months of October, November and January last. The following is the substance of these Ordinances:—

In applying the Law of 17th May, 1901, granting exemption from duty on bags containing coffee intended for exportation, the export duty on coffee is to be charged according to net weight, two and a-half pounds per bag being deducted from the total gross weight.

Shoemakers' thread of linen or hemp, untwisted, is dutiable at the rate of 30 centavos per kilogram.

Rye flour (not separately specified in the Tariff in force) is to be subject to a duty of 2 centavos per kilogram, on importation.

Socks of Scotch yarn and imitations thereof are dutiable at the rate of 1 peso 50 centavos per kilogram.

Electric Ventilating fans (not specially mentioned in the Tariff) are dutiable at the rate of 30 centavos per kilogram.

Maize and beans necessary for consumption may be imported free of duty and warehousing charges for a period of one year from the date of the Ordinance—1st January, 1902.

Spain.—TARIFF CLASSIFICATION OF PENCIL CASES AND OF LEADS FOR PENCILS.—The *Gaceta de Madrid* for the 1st ult. contains the text of a Royal Order, according to which cases made to receive and hold writing leads, as well as those holding the lead in a fixed form, like wooden pencils, are dutiable under No. 409 of the Spanish Tariff, at the rate of 1 peseta 50 cts. per kilogram. (£3. 1s. per cwt.). The leads themselves ("lapices"), cut and prepared for use in lead pencils or in pencil cases, are dutiable under No. 294 of the Tariff at the rate of 2 pesetas per kilogram. (£4. 1s. 3d. per cwt.).

TRANSPORT AND FREIGHTS.

The Freight Market.—Outward coal rates are still falling, as recent Welsh fixtures will show, viz.: 5s. 6d. Genoa, 6s. Venice, 5s. Port Said, 6s. 6d. Las Palmas, 12s. Rio, 13s. 3d. River Plate, 9s. 6d. Bombay, 10s. 6d. Colombo. The Cape Government coal contracts have been placed and the contractors are offering 14s. to 14s. 6d. America shows a slightly improved demand for new season's grain, which is quoted at about 2s. 6d. Australian chartering is practically at a standstill and little improvement can be anticipated even with the advent of the new season. Black Sea continues to improve for backward loading. Current berth quotations are 8s. 6d. Odessa, 9s. Sulina. Danube and Azoff weak. Eastern markets have slumped and current rates are 10s. Bombay, 12s. Kurrachee,

20s. Java, 15s. is reported to have been accepted from Rangoon. Mediterranean markets weak and, except for ore, practically no business is being effected. River Plate market has completely fallen away, especially for prompt loading. For later loading San Lorenzo is quoted at 11s. to 12s.—WEDDEL, TURNER & Co., July 24, 1902.

UNITED KINGDOM.

New Line of Steamers to South Africa.—Messrs. R. P. Houston and Co., Liverpool, announce that they have made arrangements for a regular and continuous service of their steamers between the United Kingdom and Cape Town, Mossel Bay, Algoa Bay, East London, Natal, Delagoa Bay, and Beira. The steamers to be employed on this service are fast cargo boats, and freight contracts have already been made for a number of years with a number of the leading South African corporations and companies. It is understood that Messrs. Houston have arranged the new service at the request of the parties concerned, who are anxious to have shipping facilities independent of the so-called "conference" lines. The first departure of the new service was that of the *Hostilius* (3,325 tons), from Middlesbrough, July 20, Glasgow, July 26, and Liverpool July 30, and she will be followed at fortnightly intervals by other steamers of a tonnage ranging from 4,233 tons to 5,662 tons. Messrs. Houston have already started a fortnightly service in conjunction with the Prince Line between New York and the South African ports.

COLONIES.

New Zealand and South Africa.—The new steamship services between New Zealand and South Africa will, it is reported, consist of (1) a monthly direct line to Durban, Port Elizabeth, and Table Bay, and (2) a monthly line to the same ports via West Australia. Four New Zealand ports will be called at, probably Dunedin, Lyttelton, Wellington, and Auckland.

Rhodesian Railways.—At a meeting of the Chamber of Commerce held at Bulawayo on the 4th ult., it was stated that Sir Charles Metcalfe intended to do his utmost to connect the railway from Bulawayo to Gwelo before the rainy season, and that it was expected that the railway would be finished in October, giving through connection between Cape Town and Beira. A petition by the Chamber of Commerce to the Chartered Company urging the extension of the railway to Tuli with a view to obtaining connection with the Transvaal and Delagoa Bay was adopted.

FOREIGN COUNTRIES.

Colombia Republic.—The German Consul at Baranquilla reports that nothing was done last year by the Colombian Government to render the entrance into the Magdalena river more easy for shipping, and that shipowners and shipmasters would do well to refrain from chartering their vessels to the river port of Baranquilla until a suitable tug and pilotage service is established. The passage of the bar is very dangerous.

France.—A decree has been signed by the President of the French Republic appointing a commission to consider the means of centralising the mercantile marine services in the same ministerial department. Hitherto shipowners have had to deal with two different departments, namely, Marine and Commerce and Public Works.—*Fairplay*.

German South-West Africa.—The *Times* correspondent at Berlin writes, under date June 27 last: The railway line which was opened last Friday from Swakopmund, on the coast of German South-West Africa, to Windhoek, the principal settlement in the interior, was commenced in September, 1897. It has a length of about 380 kilometres (about 235 miles), and reaches Windhoek via Jakalswater, Abbabis, Karabib, and Okahandja. It was originally supposed that the construction of the line would not cost more than five million marks (£250,000), but this estimate has proved insufficient, and the Reichstag has already voted over 13 million marks (£650,000) for the purpose. The construction of a harbour at Swakopmund will cost another two million marks (£100,000). According to the estimate for 1902, the revenue is expected to cover a working expenditure of 857,000 marks (£42,850). This leaves no margin for interest on the capital. It was originally proposed that the service should consist of two goods trains a day in either direction and two passenger trains weekly in either direction, but it appears that only one goods train a day will run at present. The speeds attained are not great, the goods trains being timed to run ten to 12 kilometres and the passenger trains 18 kilometres an hour.

The railway was undertaken in order to overcome the difficulties of oxen transport, which was often threatened with interruption by rinderpest. The inhabitants of Windhoek depend largely for the necessities of life on imports from the coast, and an interruption of the traffic would have had inconvenient, if not serious, consequences. The advocates of colonial expansion argued that the railway would greatly develop the resources of the country, and their organ in the press, the *Kolonial-Zeitung*, now anticipates a large traffic in meat with the British colonies in South Africa.

The *Freisinnige Zeitung*, the journal of Herr Richter, the leader of the Radical Left, takes a very gloomy view of the prospects of the railway. It points out that the number of whites in the protectorate, which is one-and-a-half times as large as the German Empire, is only 3,388, of whom 452 are women and 720 children. Only 2,223 of the total just given are Germans, and of these 825 belong to the colonial troops, while of the remainder the majority have some connection with the troops or the Government officials. Agriculture is only possible in the north, and suffers much from drought and locusts. The imports into German South-West Africa have consisted, so far, mainly of the necessities of life and the materials for building the railway, and the total exports have not yet reached a value of one million marks (£50,000), and of this two-thirds is accounted for by a guano factory on the coast.

Italy and China and Australia.—STEAMSHIP LINES.—The Italian Minister of Posts has arranged the details of the proposed new steamship lines between Italy and China and Australia. The intention is that the China line shall be worked by the Navigazione Generale Italiana, which will receive a subsidy of 300,000 lire for the maintenance of a monthly service between Genoa and Shanghai, independent of the existing line to Bombay, Singapore, and Hong Kong. The Australian line will be worked by the Orient Company, which, for a small subsidy, merely undertakes that its steamers shall call at Messina for the export of Sicilian agricultural products.—*Fairplay*.

United States and South Africa.—The Prince and Houston steamship lines have joined in establishing a fortnightly cargo-boat service between New York and Cape Town, Port Natal, and Delagoa Bay. The service commenced on the 16th July last.

United States.—The New York and Cuba Mail Steamship Company (Ward Line) intends to establish next year a direct cargo service from New York via the Tehuantepec Isthmus to Puget Sound. The cargoes will go by rail across the Isthmus, and by this means it is calculated that a saving of time amounting to twelve days will be made when compared with the Panama route.

OFFICIAL AND COMMERCIAL CONTRACTS.

UNITED KINGDOM.

Cardiff Railway Company.—Tenders are invited until the 11th inst. for a single-ladder DREDGER capable of dredging and discharging into hoppers from 600 to 700 tons per hour to a depth of 45 feet below water line, when working in stiff clay and gravel. Particulars may be obtained from Mr. Henry Ree, Bute Docks, Cardiff.

Leicester.—TENDERS are invited until September 3 for ELECTRICAL TRAMWAYS and MATERIALS, under the following sections, each comprising a separate contract:—(1) Steel girder tramway rails and fish-plates, (2) Bolts, nuts, and tie-bars, (3) Points, crossings, etc., (4) Stoneware pipes and conduits, (5) Feeder cables, telephone and test wires, etc., (6) Overhead electrical equipment, etc., (7) Steam-raising plant, (8) Engines, generators, etc., (9) Electric tram cars. Particulars (£2 for each contract) may be obtained from E. George Mawbey, M.Inst. C.E., Town-hall, Leicester.

Newport.—TENDERS are invited until the 7th inst. for the following works: (1) Tramways re-construction and wood paving, (2) Rails and Fish-plates, (3) Tie-bars, bolts, nuts, etc. Particulars (£10 for 1 and 2, and £2 for 3) may be obtained from Albert A. Newman, Town-hall, Newport.

North-Eastern Railway.—TENDERS are invited until October 7, for the complete ELECTRIFICATION of about 37 miles of standard gauge LINE (mostly double track) in the neighbourhood of Newcastle. Tenders must be divided into two sections, viz.:—(1) Electrical equipment of coaches and permanent way; (2) high tension cables and sub-station equipment; but tenders for either section separately will not be considered. Particulars may be obtained from Mr. Wilson Worsdell, Gateshead-on-Tyne.

Swansea.—TENDERS are invited until September 4, for the CONSTRUCTION of a DRAW BRIDGE over the North Dock Lock, together with hydraulic machinery for working the same. Particulars (£5) may be obtained from Mr. A. O. Schenk, Harbour-office, Swansea.

COLONIES.

Cape of Good Hope.—TENDERS will be received until the 12th inst. for the CONVEYANCE of all FREIGHT the Agent-General for the Cape of Good Hope may, on behalf of the Cape Colonial Government, require from ports in Great Britain to the ports of Cape Town, Mossel Bay, Port Elizabeth, and/or East London on and from 1st November, 1902. Tenders will be accepted for the conveyance of the freight by steamers and in British bottoms only. Tenders must state:—(a) the class of steamers to be employed; (b) the maximum time to be occupied in transit; (c) the maximum intervals between each sailing; (d) the maximum time within which they undertake that freight for conveyance at port of shipment shall be despatched therefrom; (e) the ports in Great Britain at which cargo will be accepted for shipment; (f) the rate chargeable for cargo where the weight of any package does not exceed five tons actual weight, and/or thirty feet in length; (g) the rates chargeable for packages exceeding five tons actual weight, and/or thirty feet in length; (h) the terms and conditions under which tender is made; (i) penalties proposed in case of non-fulfilment of contract; alternative tenders for one and two years will be received. For further particulars apply to the Agent-General for the Cape of Good Hope, 100, Victoria street, Westminster, or to the Chief Railway Storekeeper, Cape Town. **East London.**—The Town Council of East London invites TENDERS, until the 3rd of September, from FIRMS desirous of REPRESENTING them as their BUYING AGENTS in Europe, and otherwise performing the duties of London Agents to the Municipality. Tenders to state the terms upon which the applicants are prepared to buy all the Municipality's requirements. Particulars may be obtained from Messrs. Dyer and Dyer, 17, Aldermanbury, London, E.C.

Federated Malay States.—The Crown Agents for the Colonies invite TENDERS, until the 21st inst., for certain PLANT and MATERIALS in connection with the ELECTRICITY SUPPLY scheme for the town of Kuala Lumpur in the protected Native State of Selangor, Federated Malay States. **Contract A.**—Section 1. The supply, delivery and erection of a generating station consisting of:—Two 600 h.p. high pressure turbines with pipes; two 400 kilowatt three-phase alternators S switchboards and sundries. Section 2. The supply, delivery and erection of a sub-station plant consisting of:—Three 150 kilowatt motor-generators; two balancers; switchboards and sundries. **Contract B.**—Section 3. The supply and delivery f.o.b. at a European port of steel poles, cross arms, insulators, copper wire, etc., for the high-pressure transmission line. **Contract C.**—Section 4. The supply and delivery f.o.b. at a European port of arc lamps, iron posts, controlling apparatus, glow lamps and fittings. Particulars may be obtained from the Crown Agents for the Colonies, Downing-street, London, S.W., on payment of £2 for Contract A, £1 for Contract B, and £1 for Contract C. All information regarding the above contracts is to be obtained from Messrs. Preece and Cardew, 8, Queen Anne's-gate, S.W.

INDIA.

The Secretary of State for India in Council invites TENDERS, until the 6th inst., from such persons as may be willing to SUPPLY—1. Brake Vans. 2. Wheels and Axles for Carriages and Wagons. Particulars may be obtained from the Director-General of Stores, India Office, Whitehall, S.W.

East India Railway.—TENDERS are invited, until the 6th inst., for the SUPPLY at Calcutta of MATERIALS for STEEL FOUNDRY (ferro-manganese, anthracite coal, moulding composition, ground ganister, and hematite ore). Particulars (£1) may be obtained from C. W. Young, secretary to the Company, Nicholas-lane, London.

FOREIGN COUNTRIES.

Chili.—TENDERS are invited, until the 15th inst., in the Directorate-General of State Railways, Santiago, for the SUPPLY of 200 tons of STEEL RAILS of 30 kilograms, 8 tons of fish-plates, 4 tons of 3-inch spikes, and 5 tons of steel rail nails, placed in the port of Coquimbo. A provisional deposit of 5 per cent. on the value of the contract, on the terms proposed, is required to qualify any tender.

Egypt.—The Ministry of Public Works at Cairo invite TENDERS for the work of LAYING DOWN ROADS in Cairo with compressed ASPHALT, and maintaining same in good condition for a period of 20 years. Particulars may be seen at the Commercial Intelligence Branch of the Board of Trade, 50, Parliament-street, S.W.

Holland.—The Municipal Council of Amsterdam invite TENDERS, until the 8th September, for the DELIVERY and LAYING of the entire net of CABLES for the Municipal Electrical Works, consisting of:—

About 150 kilometres of divertible stream cables.

" 70 " " direct

" 25 " " wire and telephone "

with the necessary appurtenances. Particulars (4s. 2d.) may be obtained from the Municipal Printing Office, and at the office of the Director of the Electrical Works, O. Z. Achter, Curgwal, No. 213, Amsterdam.

COMMERCIAL LAW INTELLIGENCE.

Copyright in Busts of the King and Queen.—Messrs. W. BRITAIN & SONS, manufacturers of toys and artistic models, applied to Mr. Justice Walton for an injunction restraining Mr. DAVID MUDIE, toy manufacturer, from manufacturing and selling small metal busts of the King and Queen, and asked for damages. Mr. W. Britain, jun., designed and modelled small busts of the King and Queen, which the plaintiffs manufactured and sold. During the first six months of the year the plaintiffs had sold upwards of 600,000 of these busts. Last month the plaintiffs found that the defendant was manufacturing and selling busts which were copies of their models. By 54 George III, he contended that plaintiffs were entitled to the copyright for a term of fourteen years, provided the article bore the name of the maker and the date of production. Evidence was given to the effect that the plaintiffs' busts had artistic merit. The defendant said he did not know he had done any harm. He had only manufactured two gross of the busts, and sold one. He was willing to undertake not to manufacture any more of them. Mr. Justice Walton gave judgment for the plaintiffs for a perpetual injunction, nominal damages and costs. The defendant would have to give up all models and busts in his possession.

Great Indian Peninsula Railway Purchase.—INCOME TAX.—SIR ANDREW RICHARD SCORLE and others, who are the Annuity Trustees under the Great Indian Peninsula Railway Purchase Act of 1900, sued the SECRETARY OF STATE, before Mr. Justice Phillimore, to obtain the return of £8,122, paid by way of income tax for the half-year ending January 1, 1901, and £9,611 for the half-year ending July 1, 1901. They also claimed a declaration that they were not liable to pay similar amounts in future. In August, 1899, the Secretary of State gave notice of his intention to purchase the railway, and the Purchase Act of 1900 was passed. The purchase price was fixed at £34,859,217. The Secretary of State also gave notice of his intention to pay by way of annuity in half-yearly instalments. The plaintiffs' case was that the Secretary of State claimed, in making the payments, to deduct income tax, not only on the amount which was paid for interest, but on the amount paid in respect of the capital sum paid for the purchase of the undertaking. Their action was brought to recover the income tax deducted off the capital sum. It was said to be the first time the point had arisen. At the conclusion of the arguments his Lordship gave judgment for the defendant.

Shipping Necessaries.—In the Admiralty Division, Mr. CHARLES H. FORD, of West Hartlepool, sued the owners of the German steamer *Wellgunde* for £183. 10s. 11d. paid by him in respect of necessities supplied to the vessel and her master at West Hartlepool. Early in 1901 the vessel was chartered to Mr. Bernard Karschay, of Stettin, who, by the terms of the charter-party, undertook to provide the vessel with coal and other necessities, pay dues, etc., the owners to pay the master and crew, etc. On the 16th April, 1901, Karschay sub-chartered the vessel to carry a cargo of timber from Riga to Alexandria. In the course of that voyage the *Wellgunde* put into West Hartlepool for bunker coal consigned to plaintiff by arrangement between him and Karschay, and while in port incurred expenses for the coal supplied, and for port dues, pilotage, and other ship's disbursements. Plaintiff defrayed these expenses, and sent the bill to Karschay. Karschay debited the owners with £20 cash supplied and £1. 19s. 6d. for water at West Hartlepool, both paid by plaintiff, but he did not pay plaintiff. Plaintiff now sought to make defendants, the owners, responsible. Defendants denied that, having regard to the terms of the charter-party, the necessities were supplied to their credit, as neither the master, who knew of the existence of the charter, nor any other person, had authority to pledge their credit. While denying liability they paid £22. 4s. 6d. into Court as sufficient to satisfy plaintiff's claim. His Lordship (Mr. Justice Barnes), in giving judgment, said that plaintiff did not supply the goods on the orders of anyone having the express or implied authority of the owners, or held out to have such authority. It was, he said, clear that what was done in this case was done by the plaintiff on the credit of Mr. Karschay, and that the owners did not authorise Karschay to act on their behalf, nor hold him out, nor did they hold out the captain as authorised by them. Plaintiff dealt with Karschay and nobody else. The master had to get money from the charterers' agents for the use of the ship, and the money was advanced by plaintiff on the credit of Karschay, and Karschay had debited the owners with those items. As these items were advanced on the credit of Karschay by Ford, practically as his agent, he did not think they could be recovered from the owners. He gave judgment for defendants.

Responsibilities of a Tourist Agency.—An action of a somewhat remarkable character, as it was stated that one of a similar nature had never been brought before, was tried by Mr. Justice Darling and a special jury. The plaintiffs were Mr. CHARLES ROBERT EDWARD BELL and his wife, and they sued MESSRS. THOMAS COOK AND SONS, the well-known tourist agents, to recover damages for personal injuries. It appeared that in July, 1901, Mr. Bell took three tickets, for himself, his wife, and his daughter, for one of the defendants' "personally conducted" tours in Scotland. He paid £15 for the tickets, and in consideration his case was that the defendants expressly or impliedly undertook to supply horses, carriages, drivers, and conductors fit and adequate to convey the plaintiffs safely upon the driving excursions. One of the excursions was from Forres by the banks of the river Findhorn, the road along which was a narrow one, with a bank or hill on one side, and a declivity on the other. It was said that in consequence of the restiveness of the horses or the incompetence or neglect of the driver, the horses went over the declivity, dragging with them the carriage, which struck against the trunk of a tree on the incline and overturned. As a consequence plaintiff and his wife sustained severe injuries. The defendants contended that their only contract was that horses and carriages supplied by a competent jobmaster should be in waiting at Forres. Mr. Justice Darling left the following questions of fact to the jury:—(1) Did the defendants exercise reasonable care to secure that proper carriages, horses, and driver should be in readiness to drive the plaintiffs? (2) Was the driver competent in the discharge of his duties? (3) Did the accident happen by reason of the driver's negligence? (4) Were the horses reasonably fit for the drive? The jury answered the first two questions in the affirmative, but they were unable to agree as to the remaining ones. His Lordship said that their findings amounted to a verdict for the defendants, for whom he entered judgment, with costs.

Commandeered Gold.—The Court of Appeal has given judgment dismissing the appeal of the plaintiffs in the action of the ROBINSON GOLD MINING COMPANY, LIMITED, and others v. the ALLIANCE MARINE AND GENERAL ASSURANCE COMPANY, LIMITED, against the judgment of Mr. Justice Phillimore that the loss of £223,750 in gold coin which was "commandeered" by the late Transvaal Government at Vereeniging on Oct. 2, 1899, was not covered by the insurance policy issued by the defendants, which excepted, *inter alia*, "capture, seizure, and detention."

BRITISH CONSULAR REPORTS.

China (Niu-chwang).—TRADE IN 1901.—In a recent report H.M. Consul gives an account of the trade of the Manchurian port of Niu-chwang during the year 1901. After noting that the trade of Niu-chwang for the year attained dimensions only £1,002,358 short of that of the record year, 1899 (£7,253,643), the Consul points out that it was largely inflated by an overflow from the trade of 1900, which was completely congested by the disturbances in Manchuria and the general dislocation of commerce and finance resulting from them. The returns of 1901 would, however, have been still greater than they are had not the disbandment of the native soldiery by the Russian military authorities in 1900 let loose great numbers of armed men, who speedily terrorized the entire country as brigands and blackmailers. The discovery of bubonic plague in the port in August also hampered trade severely, owing to the very stringent measures taken by the Russian administration to prevent the spread of the disease. The Russian occupation of the port, involving the taking over of the native Customs and *likin* offices, made it possible to arrive at some approximate estimate of the value and volume of the native shipping trade of Niu-chwang. The net value of the junk trade in 1901 was 16,263,229 Hai-kwan taels. The net total value of the trade by steamer and junk was 58,501,513 taels. The net total value of the imports and exports coming under the Chinese Imperial Maritime Customs was 42,262,209 taels. The gradual disappearance of British cotton goods, such as drills, jeans and sheetings, from the Manchurian market is mentioned, and also the rapid increase of imported American manufactures, while the trade in British grey shirtings is now contested, thought not at present to any large extent, by India and Japan. Among the native products, silk is described as a very rising industry, Ta-tung-ku, near the mouth of the Ya-lu river, forming a great silk centre with regular steamer communication with Chifu. In foreign shipping, Japanese steamers have come rapidly to the front, the tonnage under the Japanese flag exceeding that under the British by 6,745 tons in 1900, and 5,431 tons in 1901. The ordinary revenue collected by the Imperial Maritime Customs in 1901 was 751,621 taels, but the *likin* tax, also collected by the Imperial Maritime Customs under the orders of the Russian provisional Government on steamer-borne imports and exports at the time of payment of duties amounted to 203,575 taels. With regard to the port of Dalny, newly created by the Russians, the report observes that, while it is certain to be the terminus of a large passenger traffic between Asia and Europe, it is doubtful whether, commercially, it will develop into anything more than a Manchurian port like Niu-chwang. If it is to prove a success, the line some 600 miles in length from it to Harbin must be doubled, the railway must be properly administered, and the Chinese merchants be afforded the same facilities in Dalny as they are in the treaty ports of China.

China (Wu-chau).—LAWLESSNESS IN SOUTHERN CHINA.—The latest British Consular report from Wu-chau, on the West river, describes Kwang-si province as suffering from chronic disorder of a more or less serious nature. Last year witnessed the usual outbreak of disturbances in various parts of the province. Predatory raids on small towns and villages and the plundering of cargo boats were of frequent occurrence, and for a month or two a feeling of uncertainty prevailed which much impeded the progress of trade. Large quantities of merchandise had to be warehoused at Nan-ning, which is the great distributing centre for that part of the province and portions of the adjacent provinces, till the security of the trade routes was to some extent restored. After a time the bandits were temporarily dispersed, and trade resumed its normal course, but the disturbances broke out again in April last in a more acute form. The district beyond Nan-ning is overrun by large bands of brigands, numbering from a few hundred to 1,000 or more in a single band, who rove over the country plundering the people and even attacking, sometimes with success, the troops that are sent against them. As soon as they find themselves in danger they break up and scatter in the hills, where it is difficult for the soldiers to pursue them, even if they had the energy and inclination to do so. The bandits consist to a considerable extent of "braves" formerly belonging to Marshal Su's frontier force, who were recently disbanded, and, not receiving the pay due to them, marched off with their rifles and ammunition, both of the best. They are therefore, more or less trained men and well armed. As a consequence of these troubles transit trade beyond Nan-ning is, for the time being, almost at a standstill.

Denmark (Copenhagen).—H.M. Consul at Copenhagen says, in his annual report, that the export of butter from Denmark exceeded by 110,000 cwt. the export of the previous year, and prices ruled high. As usual, nearly the whole of the butter exported went to Great Britain—that is, 1,620,000 cwt. out of a total of 1,705,000 cwt. Besides the exports of Danish butter, the Danish transit trade with foreign butter is annually increasing. Most of the foreign butter comes from Russia and Siberia. A large quantity of butter in tins goes to Brazil and South Africa. The largest union of farmers in Denmark for dairy produce is the Danish Estates Butter Factory, or "Trifolium." It possesses 6,200 cows, yielding 31,000,000 pounds of milk annually. The factory buildings cover 2,000 odd square yards, and consist of a three-winged building, a boiler-house, and an engine-house. The front building, which is 147 feet in length, is of one story, having an exterior discharging platform running the whole length, and all platforms on a level with it inside the building. One wing contains three departments, namely, a separator hall, a weighing-room, and a cheese-room. All the floors are paved with tiles or concrete. Large skylights and ventilators, with adjustable blinds, are fixed in the ceilings. Close by is a rinsing-house in connection with the main building. At the end of the separator-room is the receiving-room and magazine for butter. The milk is conveyed to the dairy in specially-built wagons, and after being unloaded on the exterior platform, is taken through sliding doors to the separator hall to the weighing machines, each capable of weighing 1,000 pounds of milk at a time. There are six separators, each having a skimming power of 4,000 pounds an hour. The separators are divided into two series, each of which has its own sweet milk heater and cream pasteurising apparatus. All waste water is collected in pipes under the floor, and conducted to a well, from which it is pumped up to a hot water tank. All pails used are placed upon an automatic carrier, which takes them to the rinsing-room, where they are at once scalded and washed. Under the pail carrier are tin gutters, into which the milk still left in the pails may drip while they are being conveyed to the washing-room. Captain Boyle also describes the cream and cheese departments, showing that in these matters, as in the butter export trade, co-operation in Denmark has risen to a higher standard. Especially is this noticeable in the export of pork and eggs. The first Danish co-operative dairy was formed in Jutland in 1882, and now the dairies number 1,040, producing milk of the annual value of £7,112,000.

H.M. Consul also reports that a great boon to commercial travellers in Denmark is the issue of season tickets enabling the

holder to travel over the whole of the State railways in that country as frequently as he wishes. The cost of these tickets is as follows:—

	Available for—			
	14 Days.	1 Month.	2 Months.	3 Months.
Class II.	£ s. d. 1 16 0	£ s. d. 2 15 6	£ s. d. 4 3 3	£ s. d. 5 11 0
Class III.	£ s. d. 1 2 3	£ s. d. 1 13 4	£ s. d. 2 10 0	£ s. d. 3 6 8

Practically all the railways in Denmark belong to the State, so the acquisition of such a season ticket conveys the holder to and from every town of any importance. H.M. Consul again points out that every information as to travellers' licences can be obtained by applying to him.

Germany (Frankfort).—GERMAN COMMERCIAL ACADEMIES.—In a report from the Consul-General at Frankfort, on the trade of his district, an interesting account is given of the latest phases of education for commercial life in Germany. The report states that Germany's modern development from an agricultural into an industrial and commercial country constantly demands from the leading merchants greater efficiency; they are often called upon to solve questions of world-wide bearing, to negotiate with the Federal or State authorities, to give technical evidence before or take part in Parliamentary commissions, so that it has been deemed desirable that at least a part of the younger commercial generation be offered an education beyond what is taught at elementary schools, finishing schools, or by the routine of daily commercial life. The want of such educational establishments until recently has, to a great extent, favoured the German lawyers, who were drawn upon to fill the leading places in great German establishments and institutions; but even the lawyers, whose claims were based upon brilliant examinations rather than upon a practical knowledge of the law, for a lawyer with a large practice cannot easily be induced to abandon it, were not found satisfactory judges of the needs and opinions of the classes whose interests they were called upon to further. Thus a movement was called into existence in Germany in favour of founding commercial academies. In Germany there are at present four different kinds of commercial academies. At Leipzig the academy was founded in connection with the university; at Aix-la-Chapelle it was founded in connection with the technical high school at Cologne, as a commercial teaching institute pure and simple, and altogether apart; the one opened at Frankfort-on-Main on October 21, 1901, was erected upon "the broad basis of political economy." It was founded by scientific societies already existing in the town together with the pecuniary assistance of prominent citizens; local patriots hope that in due time it may develop into and form part of a new university. Its primary purpose is, of course, the education and perfection of new generations of merchants, but it endeavours no less to offer to practical men opportunities of supplementing an education which, because it was determined by a set purpose, must needs have been one-sided. Thus it affords officials and technical men the chance of getting an insight into commercial life; commercial men to get acquainted with the routine of different Government offices, with the machinery of Government; both can learn the wants of the working classes; foremen, if they wish to do so, can acquaint themselves with the management of trade unions, syndicates, etc., and it is hoped that the very fact of so many different social classes mixing and becoming acquainted in this institute will further develop the "social" aim of this new academy.

Russia (Warsaw).—BRITISH TRADE.—In a recent report, H.M. Consul-General at Warsaw observes, with reference to the question of language, that although some British firms have been wise enough to understand that it is of no more use sending an ordinary British trade circular or price-list to anyone here than it would be for a Polish merchant to send one of his to the United Kingdom, the general idea appears to be that that is all sufficient in opening up business here. The other day a firm sent five British postcards, which are not accepted as such here, with the request that they should be posted to firms likely to employ them as commission agents, on the cards being a few words in English to say they were willing to act in that capacity. "One difficulty experienced is that many British firms write to ask for the names of 'importers' or 'exporters,' or of 'purchasers of British goods,' and when asked to specify, say, 'Oh, we deal in everything.' That may be, but in a town of 750,000 inhabitants it is difficult to give all exporters or importers." Lodz, with a population of nearly 500,000, Vilno, with over 160,000, Minsk, 100,000, Kovno, 75,000, Lublin, 50,000, besides several others with from 25,000 to 50,000, all have shops which sell foreign goods, chiefly German. In all these towns it is worth while trying to open up business in many lines, but it can only be done by a traveller speaking Polish and Russian, or at least German, and offering goods at the same price and on the same terms as those who at present supply the market.

"I recently asked a prominent British resident of long standing and very large commercial experience why British goods do not make more way in Poland. This is what he tells me:—'British firms are, as a rule, very badly represented either by German or Jewish agents who, when they have formed a connection amongst manufacturers, try to transfer them to some foreign firm who offer more favourable conditions. British firms would do well to employ good travellers who know one of the languages current here, either Russian or German, and who would quote the prices in Russian currency and Russian weights, and also the exact price the given article will cost delivered in the works.'

"Should the Russian and German Governments not be able to come to an agreement with the new treaty of commerce, there would be the prospect of a tariff war which would very much injure the export of German manufactures to Russia. British manufacturers would then have a good chance of getting hold of the Russian market; they would, however, require to make up their minds to make some changes in their way of doing business; besides employing good representatives who thoroughly enjoy their confidence, they must be prepared to depart from some of their hard and fast rules; they must be prepared to concede longer credits up to six months instead of the usual one month, and also to be more considerate of the wishes of their customers respecting the dimensions and make up of the goods. The Germans have in those respects been much wiser and more conciliatory, and have tried harder to suit themselves to the purchasers' tastes and wishes than any other nationality exporting to Russia."

Referring to the construction of a railway from Siedlee to Bologoje, the Consul-General notes the appointment by the Minister of Finance of a special commission to enquire what articles, till now imported from abroad, can be replaced by articles made in Russia. This step, the object of which is to protect home industry, was greeted with great satisfaction by those interested, and it is believed that it will lead to further publications of laws prohibiting in many cases the use of foreign-made articles.

FOREIGN CONSULAR REPORTS.

Beet-Sugar Acreage on the Continent.—The United States Consul-General in Berlin, who has given a great deal of attention to the beet-sugar question, and whose estimates have always turned out to be pretty correct, has made a report, under date of May 23, upon the effect produced on the planting of beets for sugar by the conference recently held. He emphasizes the fact that the area of sugar-beet planting throughout Germany and the other Continental countries is one of the most interesting features of the industrial situation. When the Brussels Conference abolishing export bounties had concluded its work, the syndicate of German sugar producers held a meeting and sent out an earnest demand that beet growers should reduce as far as possible their beet-planting for 1902. This policy was adopted in order "to make headway against the enormous surplus of sugar that now overloads and depresses the European market." He now gives the result of this appeal. The returns show that Germany has planted this spring 1,046,396 acres, which is a decrease of 11·2 per cent. from the area planted last year. Every province shows a decrease, the reduction of acreage ranging from 1·2 per cent. in Pomerania to 36 per cent. in Baden, 45 per cent. in Bavaria, and 54·1 per cent. in Hesse-Nassau. Four large factories have been shut down and will remain closed during the coming campaign against over-production of beet-sugar. He also gives returns from other sugar-producing countries of the Continent, the following table showing the variations of beet area as compared with last year :—

Country.	Area.	Increase.		Decrease.
		Aeres.	Per cent.	Per cent.
Austria-Hungary	751,011	—	—	16·2
France	551,774	—	—	23·8
Russia	1,470,566	—	—	—
Belgium	130,516	—	—	24
Holland	77,009	—	—	35
Sweden	59,887	—	—	16·4
Denmark	35,830	—	4·8	—

Four factories in Belgium and eight in Holland will suspend operations during 1902-3, and the mean average reduction in area of beet cultivation in these eight sugar-growing countries will be a reduction by 11·34 per cent. of the total acreage of the year 1901.

Frozen Salmon in Germany.—Mr. Consul Monaghan, of Chemnitz, believes that a large business can be done in frozen salmon in Germany, if special attention is given to transportation. Enquiries as to price showed that Oregon salmon could be bought for 1·40 marks (35 cents.), while German salmon costs at the present time 5 marks, or about \$1·25 per pound. The fish were frozen in Oregon and shipped in this frozen state to Europe. It is claimed that, if thawed in cold water and then cooked, the fish retains its flavour. If the above is correct, there can be no doubt that Germany would make a very good market, as there is hardly any fish worth eating that can be had here for less than 40 cents per pound. Packers of salmon should look into this matter. A distributing house could be established in Hamburg or Bremen which would attend to the shipping of the fish to the inland German cities and towns.

Fruit in China.—The following report by the United States Consul at Niuchwang will be of interest to Colonial shippers of fruit. The Chinese appetite for fresh fruit is strong, and apples are in great favour; the only obstacle to the creation of a large market is the inability of the masses to pay anything but a low price. The average Chinaman does not distinguish the different varieties of apples, and if inferior grades could be sent at low rates, an extensive outlet could be created. Northern routes are the best for shipping green fruits. All shipments of apples for the Northern ports of China should be sent by October 1, on account of the danger of freezing if they arrive late in the season. If the fruit reaches North China in good condition, it will keep well on account of the cold dry climate. The presence of the Russians in Vladivostok, Port Arthur, and Dalny, will increase the market for apples, as the Russians like this fruit very much. The Consul instances a shipment of fifty boxes of apples which were sent from Portland on September 28, 1901, and reached Niuchwang, November 10. They were packed in ordinary light 10 by 11 by 22 inch boxes, cleated on both sides, and the apples were wrapped in paper. The packages held in good shape, and every box arrived intact. The percentage of loss was greatest with the Red Russian variety (75 per cent.) and least with Ben Davis (2 per cent.); the Spitzenberg lost 10 per cent.; the Shannon pippin 25 per cent.; and the Jonathan 50 per cent. California ships a quantity of third grade yellow Newtons to China. Some of these are consumed by foreigners, but most of them go to the Chinese fruit stands and restaurants and are eaten by natives.

Madras and West African Peanuts.—In course of a report on French methods of peanut crushing, the United States Consul-General at Marseilles gives some interesting particulars regarding Madras and West African nuts. The yield of oil from decorticated peanuts from the Madras coast, which constitute the largest import for the Marseilles soap trade, is from 39 to 40 per cent. of their weight. The resultant cake contains from 7 to 9 per cent. of oil. The price of the oil depends largely upon the purpose for which it is intended. Oil from Madras decorticated nuts, utilized by soap manufacturers, brings 58 francs per 100 kilograms (\$11·19 per 220 pounds) naked, first pressure, delivered to buyers' stores. The finest edible oils are obtained from nuts imported in the shell, these coming from the West Coast of Africa, chiefly from Rufisque and Gambia. Oils from these nuts are worth from 75 to 80 francs per 100 kilograms (\$14·47 to \$15·44 per 220 pounds), naked, first pressure. Hand decorticated Mozambique nuts give an oil now worth from 74 to 75 francs (\$14·28 to \$14·47). The second pressure oil from Rufisque, Mozambique, and Gambia nuts, which is suitable for illuminating purposes, is worth from 68 to 70 francs per 100 kilograms (\$13·12 to \$13·51 per 220 pounds). Ground-nut cake brings from 12·75 to 13 francs (\$2·46 to \$2·50) per 100 kilograms at mills, or 13·25 to 13·50 francs (\$2·55 to \$2·60) delivered f.o.b. Marseilles in bulk, that is to say, without bags. There is usually a difference of 3 francs per 100 kilograms (58 cents per 220 pounds) in this market in favour of ground-nut cakes over cottonseed cakes. The latter are worth delinted, 10 francs (\$1·93) per 100 kilograms at mills. Marseilles oil cakes are sold most conclusively for cattle feed. The soap mills of Marseilles consume on an average 3,000 to 3,500 tons of ground-nut and other seed oil per month, and about the same quantity of copra and palm-kernel oil.

Mexican Tobacco.—According to a report by the Belgian Consul at Mexican city, the production of tobacco in Mexico has recently increased considerably, owing to the fact that several new plantations have been cultivated. During the last five years the exports of this article have varied greatly, attaining their highest point in 1898, during which year 7,997,352 lb. of tobacco in leaf, and 1,250,000 lb. of manufactured tobacco were shipped. During the year 1900 the local factories consumed a total of 15,000,000 lb. of tobacco, of which 2,000,000 lb.

came from Virginia. The production of tobacco in leaf in Mexico for the year 1902 is estimated at 17,000,000 lb. During the year 1900 Mexican factories produced 377,502,882 packets of cigarettes, containing 15 to 25 cigarettes each, and 120,536,924 cigars. Tobacco planters and manufacturers state that the quality of Mexican tobacco has greatly improved, and that at the present time it is almost, if not quite, equal to the best Cuban products.

CHAMBERS OF COMMERCE REPORTS.

UNITED KINGDOM.

Dundee.—A quarterly meeting of Dundee Chamber of Commerce was held in the Royal Exchange on the 3rd ult. Mr. A. B. GILROY, the president, occupied the chair, and, in moving the adoption of the minutes, referred in fitting terms to the illness of the King, the postponement of the Coronation festivities, and went on to remark that they all fervently hoped that the satisfactory progress of His Majesty towards convalescence would be steadily maintained, and that they might be able very soon to offer their heartfelt congratulations on his complete restoration to health and strength, and that at no distant date they might see him duly crowned. When that happy event took place, the Chamber could send the address referred to in the minutes. Proceeding, he went on to remark that the most important subject dealt with by the Directors was in regard to the rating of machinery for the purposes of local taxation. In conformity with the decision of the annual meeting of the Chamber, the Directors had communicated with all the Scottish Members of Parliament, and urged them to vote for the second reading of a Bill before Parliament, the object of which was more clearly to define the law as to the taxation of machinery in England. Efforts had been made to get the Bill made applicable to Scotland, and, narrating the course of Parliamentary procedure, he explained that the measure had been shelved in the meantime. Mr. Renshaw, one of the Scottish members who had taken a great interest in this and other commercial matters, had introduced a Bill, the object of which was to ensure that the practice which had so long prevailed of only including as heritable the machinery required for driving a mill or factory should be continued. The local Assessor of Taxes, encouraged by his success in a recent decision dealing with engineers' tools, was understood to have under consideration a scheme for raising the rateable value of jute factories by including factories hitherto exempt. If he was successful it would lay a heavy burden on some of the members of the Chamber, and give their Indian and foreign competitors a still greater advantage over them than they had at present. The Directors would continue to watch carefully over the matter, and use all their influence for the benefit of the members. He expressed satisfaction that the Chancellor of the Exchequer had seen fit to withdraw the tax on cheques, against which nearly every Chamber in the Kingdom had protested, and concluded by drawing attention to the fact that there had been a considerable increase of membership during the quarter, about 25 new members having joined.

Walsall.—The monthly meeting of the Council of this Chamber was held on 30th June, when the president, Mr. F. RATHBONE, occupied the chair. Before proceeding to the ordinary business, it was resolved to send a telegram to the Royal Family, expressing the sympathy of the Chamber in the serious illness of His Majesty the King. A reply was read from the Telephone Company stating that they had not, as alleged, lost time in repairing the lines after the great storm before Christmas, and that as the damage was an act of Providence, no rebate could be allowed on the subscriptions for the time when the instruments could not be used. On the proposition of Mr. CLARK, it was resolved to refer the letter to the General Purposes Committee, several members contending that undue time had been lost. The report of the Committee appointed to consider certain proposals *re* postal orders was received. Only meagre information had been received from the Postal Authorities, but the Committee thought that the poundage on small orders should be reduced, and that the time limit be extended or dispensed with altogether. A discussion took place on the Standardization of Metals, and it was generally held that it was necessary that active steps should be taken to arouse public interest; to that end, it was resolved to bring it before the next meeting of the Associated Chambers of Commerce, in conjunction with the Sheffield Chamber. The Parliamentary Bills Committee recommended that support be given to the Merchants Shipping (Lighthouses) Bill and the Bankruptcy Law Amendment Bill. In response to the Decimal Association's request, it was also resolved to write urging that the question of the Metric System be brought before the coming Colonial Conference.

GENERAL INTELLIGENCE OF THE PAST MONTH.

July, 1902.

UNITED KINGDOM.

JULY 1st: The King continued to make satisfactory progress. The Prince of Wales reviewed the Colonial Troops in London. The Colonial Premiers were entertained at a banquet in the Inner Temple. An Exhibition of Egyptian Antiquities was opened at University College. Lord Strathcona presided at the Annual Dinner in celebration of Dominion Day.

2nd: The Queen and the Prince of Wales reviewed the Indian Troops on the Horse Guards Parade. The trial of the Pyx took place. The National Rose Society's Show was opened.

3rd: The Royal Coronation Guests left England. The Hospital Sunday Fund exceeded £40,000. In the House of Lords the Finance Bill was read a second time. In the House of Commons the British Museum Bill was read a third time.

4th: The King continued to make very satisfactory progress. A brilliant reception was given to the Indian Chiefs at the India Office, at which the Prince of Wales, representing the King, was present, with the Princess of Wales and the Duke of Connaught. The second Meeting of the Colonial Conference was held; Mr. Chamberlain presided. The Annual Banquet of the American Society was held in London.

5th: The King's dinner to 500,000 of the poor of London took place. The King was pronounced to be out of danger. The Royal Agricultural Society's Show was opened at Carlisle.

7th: The Prince and Princess of Wales visited Guy's Hospital. A carriage accident occurred to Mr. Chamberlain, after his inspection of the West African Troops. The Duke of Devonshire presided at the Annual Meeting of the British Empire League. The National Indian Association held a Coronation Reception at the Imperial Institute. Death of Lady Milner.

8th: The Queen's tea to servants took place. Death of the Earl of Arundel.

9th: The Prince of Wales presided at the tenth annual meeting of the Royal College of Music. Lord Roberts inspected the boys of the Duke of York's School. Prince Henry of Battenberg was present at the annual meeting of the Colonial Nursing Association. Death of the Duchess of Atholl.

10th: The Queen opened the Imperial Coronation Bazaar at the Royal Botanical Gardens. The Prince and Princess of Wales held an evening reception at St. James's Palace. Death of Lord Cheylesmore. An Educational Conference was held at the Colonial Office.

11th: Lord Onslow presided at the Empire Coronation Banquet at the Guildhall. The annual meeting of the British Homœopathic Congress was held. Lord Salisbury resigned.

12th: Mr. Balfour accepted the post of Prime Minister vacated by Lord Salisbury. Lord Kitchener reached Southampton, and, on arrival in London, was enthusiastically received. He was received by the King at Buckingham Palace, and was presented with the Order of Merit.

14th: The pending resignation of Sir Michael Hicks-Beach was announced. In the House of Lords the Licensing Bill was read a second time. A Unionist Meeting was held at the Foreign Office. A dinner was given by the National Liberal Club in honour of the Colonial Premiers.

15th: The King, accompanied by the Queen, journeyed from London to Portsmouth, and was carried on board the Royal Yacht. The funeral of Lord Pauncefoot took place at Newark-on-Trent. In the House of Commons the Education Vote was agreed to.

16th: The King was much benefited by his removal to Cowes. The Canadian Club Dinner was held under the presidency of Lord Strathcona. In the House of Commons the London Tube Railway Bills were read a second time. The resignation of Earl Cadogan as Viceroy of Ireland was announced. Death of Mr. W. Johnston (U.), M.P. for Belfast.

18th: It was announced that the Coronation would take place on August 9. Mr. Chamberlain presided at the third sitting of the Colonial Conference. The Gordon Statue in St. Martin's-place was unveiled by the Duke of Cambridge. Sir Henry Fowler presided at the annual general meeting of the Incorporated Law Society. The freedom of St. Andrews was conferred on Lord Elgin, Lord Balfour, and Mr. Carnegie.

19th: The Indian troops visited Windsor Castle. Mr. Balfour opened a new Conservative Club at Fulham. The Guards Battalions landed from South Africa. The Indian Princes were present at a Garden party at Hatfield. Death of Mr. Kegan Paul.

21st: The King continued to gain strength. Mr. Seddon was presented with a testimonial by New Zealand Colonists in London. The Honorary degree of D.C.L. was conferred on Sir E. Barton at Oxford.

22nd: Death of Dr. Croke, Archbishop of Cashel. The fifth congress of the International Co-operative Alliance was opened at Manchester.

23rd: An exhibition of Japanese Art was opened in White-chapel. The Duchess of Devonshire opened the Nature Study Exhibition at the Royal Botanic Gardens.

24th: The King continued to make uninterrupted progress towards recovery.

25th: The King went round the Isle of Wight in his yacht. Princess Henry of Battenberg visited the Naval and Military Exhibition at Portsmouth. Lord Roberts visited Sandhurst. The fifth meeting of the Colonial Conference took place. Lord Cadogan opened the Chelsea Physic Garden. Lord Charles Beresford spoke at the 12th annual dinner of the Institute of Marine Engineers. Death of Canon Blackley.

26th: The Colonial Premiers visited Edinburgh. The Cancer Research Fund amounted to £36,491. The King held a Council on board the Royal Yacht at Cowes. General Lucas Meyer arrived at Southampton. Death of Lady Harriet Duncombe.

28th: The Colonial Premiers visited Glasgow. The freedom of the Cutlers' Company was presented to Lieut.-Gen. Sir J. D. French. The General Ship Owners' Society held their annual meeting. The Alien Immigration Commission held a meeting at St. George's Town-hall, E., Lord James of Hereford presiding.

29th: A Viscounty was conferred on Lord Kitchener. Mr. R. Barran (L.) was elected M.P. for North Leeds in the room of Mr. W. L. Jackson, raised to the peerage. The British Medical Association opened its annual meeting at Manchester. Death of Dr. Searle, Master of Pembroke College, Cambridge.

30th: The Colonial Conference held its sixth meeting at the Colonial Office. Death of Lord Gerard. Death of Bishop Walsh.

31st: The annual meeting of the S.P.C.A. was held. Lord Rosebery presided at the Liberal League Dinner.

COLONIES.

Australia.—3rd: The Federal Senate continued to reduce the Customs duties.—10th: The Australian State Capitals were illuminated in celebration of the King's recovery.—17th: Lord Tennyson arrived at Melbourne, and was sworn in as temporary Governor-General. **New South Wales.**—7th: An Irish demonstration, presided over by the Mayor, in favour of Home Rule for Ireland, took place in Sydney. **Victoria.**—3rd: Lord Hopetoun left Melbourne for England.—16th: The State Assembly Reform Bill was published. **South Australia.**—3rd: The State Parliament was opened by Lord Tennyson.

Queensland.—9th: The State Parliament was opened; the Governor announced increased taxation.—16th: Lord Hopetoun embarked at Brisbane for England. **Western Australia.**—17th: Sir A. Lawley opened the second session of the Fourth Parliament. **Tasmania.**—16th: The Premier proposed the amalgamation of the two Chambers.

New Zealand.—1st: Parliament was opened; the Governor announced that it was intended to appoint commercial agents in England, the Cape, and Australia.

Canada.—11th: The Canadian Manufacturers' Association invited the Australian Premiers to the Association's Annual Banquet at Halifax, on August 14.—24th: Lord Dundonald arrived at Quebec.

Cape Colony.—3rd: 34,000 persons signed the petition in favour of the suspension of the Constitution.—8th: The Cape Parliament was summoned to meet on August 20. A despatch was received from Mr. Chamberlain urging the inadvisability of suspending the Constitution.—13th: A day of thanksgiving for peace was observed in the Dutch Churches.—15th: A deputation of members of parliament waited on the Governor to urge the filling up of parliamentary vacancies.—25th: Generals Botha and Delarey visited Paarl.—28th: Sir J. G. Sprigg arrived in Cape Town from England.—30th: Generals Botha, De Wet, and Delarey left Cape Town for Europe.

Jamaica.—17th: The Imperial Government advanced £10,000, to assist the sugar planters.

Leeward Islands.—25th: Sir Gerald Strickland was appointed Governor.

Natal.—20th: 400 Boers arrived at Durban from Colombo.—29th: The Natal Volunteer Composite Regiment was disbanded.

Newfoundland.—25th: Attorney-General Horwood was appointed Chief Justice, and Mr. Johnson Assistant Judge.

St. Vincent.—9th: Fresh eruptions of La Soufrière took place.—17th: A severe earthquake occurred.—21st: Another earthquake was felt.

Transvaal.—2nd: The second annual conference of teachers in Government schools began at Johannesburg.—4th: The press censorship was relaxed.—5th: The labour problem on the Rand caused some anxiety. Sir Percy Girouard was appointed Railway Commissioner.—8th: A scheme for repatriating the burghers was adopted.—9th: Lord Milner received the members of the Teachers' Conference.—10th: The surrender of the Boers was completed.—15th: Ex-President Steyn and Mrs. Steyn left for Europe.—16th: Sir Arthur Lawley accepted the Lieutenant-Governorship.—22nd: Louis Botha and Delarey left Pretoria for the Cape, en route to Europe.—24th: Orders were issued for the removal of the wire fence round Johannesburg.

Trinidad.—11th: It was reported that a petroleum oil-field had been discovered.

Uganda.—30th: Majors Delmé-Radcliffe and Knight, Commissioners for the delimitation of the Anglo-German boundary, arrived at Mombasa.

INDIA.

1st: The number on famine relief was 439,000.—8th: The number on famine relief was 449,000.—9th: A loan of 150 lakhs of rupees was subscribed three times over. A commission was appointed to enquire into police reform questions.—15th: The number on famine relief was 475,000.—16th: It was announced that the Viceroy would instal the Maharajah of Mysore on August 1.—27th: The number on famine relief was 423,000.—28th: The British Consul at Teng-yueh-ting informed the Burma Government that all taxes and exactions had ceased on the Bhamo route.

FOREIGN COUNTRIES.

Abyssinia.—28th: It was reported that the gold mines in the Baro valley had been sold to an English syndicate for £2,000,000.

Argentine Republic.—4th: Sir T. Holdieh left Buenos Ayres for England, having acted as arbitrator in connection with the Patagonian frontier dispute with Chili.

Belgium.—17th: The Pan-American Congress was opened at Brussels.

China.—1st: An Anglo-French syndicate secured valuable mining concession in Yun-nan.—9th: Sir J. L. Mackay and the Chinese Commissioners arrived at Han-Kau.—13th: New Chinese ministers to Russia, France, Italy, and the United States were appointed. An edict was issued providing for the completion of the Canton-Han-kau railway.—15th: The Foreign Ministers agreed to hand over Tien-tsin within four weeks.—19th: The conditions for the restoration of Tien-tsin were accepted.—21st: The Government approved of the entire abolition of *likin*.—26th: The Commercial Treaty between Great Britain and China was concluded.—28th: Chang Chih-tung was appointed Director of Commerce.—29th: The revision of the Customs tariff was completed.

Congo State.—1st: The 17th anniversary of the foundation of the State was celebrated.

Denmark.—22nd: The International Fisheries Conference was opened at Copenhagen.

Egypt.—22nd: Cholera was reported to be very prevalent. 25th: Cholera was general throughout Cairo.

France.—1st: M. Beau, French Minister in Peking, was appointed Governor-General of Indo-China.—4th: The Senate adopted the Military Service Bill.—5th: A statue of the elder Dumas was unveiled at Villers-Cotterets.—8th: The Chamber passed the Conversion Bill. The President received the Crown Prince of Siam at the Elysée.—9th: The Senate passed the Conversion Bill.—15th: Ras Makonnen arrived in Paris, and was presented to M. Loubet.—19th: The Archbishop of Paris protested against the order closing the Roman Catholic schools.—24th: Ras Makonnen left Paris for Zurich.—26th: 26 schools conducted by religious communities were closed in Paris.—28th: Admirals de Beaumont and Servan were dismissed the service.

Germany.—5th: The news of King Edward's recovery was received with great satisfaction.—10th: The death of the Duchess Frederica of Anhalt-Bernburg was announced.

Haiti.—21st: General Firmin was proclaimed President in the Province of Artabonite.

Holland.—2nd: The Queen's health continued to improve.

Italy.—10th: King Victor Emmanuel left Racconigi on his journey to Russia.—14th: The Campanile of St. Mark, Venice, suddenly fell, owing to insecure foundations.—22nd: Death of Cardinal Ledochowski in Rome.—29th: The Pope appointed Cardinal Gotti Prefect of the Propaganda, in succession to Cardinal Ledochowski.

Japan.—2nd: The Russian Grand Duke Boris arrived in Tokio.

Martinique.—9th: A fresh eruption of Mont Pelée occurred.

Persia.—25th: It was reported that the Russian Consul at Bushire had made extensive purchases of land on Bahrein Island. Earthquake shocks were felt at Bandar Abbas.

Philippines.—1st: The Provincial Government was inaugurated at Laguna.—4th: The insurrection was declared at an end, except in the Moro country.

Portuguese East Africa.—4th: A serious fire occurred at Lorenzo Marques.

Roumania.—29th: The Ministry was reconstituted, with M. Aurelian as Minister of Agriculture, Commerce and Domains.

Russia.—2nd: Serious disturbances of workmen and peasants were reported from the province of Ekaterinoslav.—13th: The King of Italy arrived at Peterhof, and was received by the Tsar.—17th: The King of Italy left Peterhof on his return to Italy.

Spain.—2nd: The King signed a decree for the regulation of non-official instruction in Spain.

Sweden.—5th: A new Ministry was formed with Herr Boström as Premier.

Turkey.—4th: M. Rouvier's project for the unification of the debt was approved by the Cabinet Council.—19th: An Iradé was issued for opening negotiations with the Ottoman Bank to convert the Customs and Fisheries Loans of 1886 and 1888.—21st: The Sultan appointed a commission to consider reform measures in Macedonia.

United States.—1st: Congress adjourned till December. The body of the late Lord Pauncelote was placed on board the cruiser *Brooklyn*, for conveyance to England.—2nd: President Roosevelt signed the Philippines Civil Government Bill.—4th: Independence Day was celebrated. A great demonstration took place at Pittsburgh on the occasion of President Roosevelt's visit.

Venezuela.—4th: It was reported that the revolutionists had captured Barquisimeto, and were marching on Valencia.

Zanzibar.—18th: Death of the Sultan Hamud.—20th: Seyyid Ali was proclaimed Sultan, with Mr. Rogers as Regent.

FORTHCOMING EVENTS.

UNITED KINGDOM.

London.—On the 6th inst. LORD ROBERTS and LORD KITCHENER will receive CONGRATULATORY ADDRESSES from the City Corporation at the Guildhall.—On the 8th the QUEEN will preside at the annual meeting of the SOLDIERS' AND SAILORS' FAMILIES ASSOCIATION, Queen's Hall.—On the 9th inst. the CORONATION OF THEIR MAJESTIES THE KING AND QUEEN will take place in Westminster Abbey.

Portsmouth.—On the 16th inst. the CORONATION NAVAL REVIEW will be held at Spithead.

FOREIGN COUNTRIES.

Germany.—An International Exhibition of Automobiles, similar to that held in 1901, will take place at Hamburg from the 3rd to the 12th October next. The exhibition, which is being organised by the Association of German Cycle Merchants, will be held in the hall of the Rotherbaum Velodrome. Particulars may be obtained on application by letter to M. Löffler, Dammthorstrasse, 32, Hamburg.

Greece.—An International Exhibition of Commerce, Industry, the Fine Arts, Hygiene, etc., will be opened at Athens on the 15th October next, under the patronage of H.R.H. the Duchess of Sparta. This enterprise, it may be noted, though regarded favourably by the Greek Government, has no official character.

Mexico.—COMMERCIAL MUSEUM OF ITALIAN PRODUCTS.—An association of Milan merchants is about to organise in Mexico city a commercial museum for all Italian products which might be imported into Mexico. At the same time a similar establishment will be founded in Milan, where samples of agricultural products such as tobacco, coffee, "henequen," caoutchouc, etc., as well as of Mexican ores will be exhibited.

It is further stated that the Hungarian Government has appointed a representative in Mexico city to establish a commercial museum for products of Hungarian manufacture.

NAVAL AND MILITARY INTELLIGENCE.

NAVAL.

Vice-Admiral A. P. M. Lake has been placed on the retired list, to date from July 1.

The *Warspite*, cruiser, was paid off at Chatham on the 1st ult. She is to be prepared for emergency service.

The *Thunderer*, second-class battleship, is ordered to be fitted at Chatham as an emergency ship at a cost of £5,400.

The *Severn*, cruiser, which is attached to the Medway Fleet Reserve, is to be fitted with wireless telegraphy apparatus.

The *Audacious* has been commissioned at Chatham by Captain H. L. Tottenham as a base for torpedo-boat destroyers.

The *Téméraire*, battleship, was commissioned at Devonport on the 16th ult. by Captain A. W. E. Prothero as depot ship of the Devonport Fleet Reserve.

The Good Service Pension of £200 a year, vacant by the death of General Sir C. L. Barnard, R.M.A., has been awarded to General Sir J. W. C. Williams, R.M.A.

The President of the Board of Trade has appointed Captain John Leslie Burr, R.N., C.M.G., to be the harbour-master at Holyhead, in place of the late Commander Clapp, R.N.

The *Ariadne*, cruiser, Captain M. E. Browning, flying the flag of Vice-Admiral Sir A. L. Douglas, has left Portsmouth Harbour for the North America and West Indies Station.

The *London*, battleship, Captain J. E. C. Goodrich, which was to have been the flagship of Admiral Sir C. F. Hotham had the review been held, left for the Mediterranean on the 3rd ult.

The following promotions have been notified:—Rear-Admiral D. H. Bosanquet to be Vice-Admiral, to date from July 1. Captain G. C. Langley to be Rear-Admiral, to date from July 1.

The *Aeolus*, cruiser, is to commission at Devonport on September 10, to replace the *Empress of India*, battleship, Captain H. L. Fleet, as flagship of Rear-Admiral E. F. Jeffreys on the coast of Ireland.

The *Royal Sovereign*, battleship, Captain F. S. Inglefield, on being relieved in the Mediterranean by the *London*, is to take the place of the *Trafalgar*, battleship, Captain G. A. Primrose, as port guardship at Portsmouth.

Rear-Admiral Sir E. Chichester terminated his appointment on the 11th ult. as officer in command of the Devonport Fleet Reserve. He is succeeded by Captain A. W. E. Prothero, who commanded the Naval Brigade at Graspán, where he was wounded.

Messrs. Vickers, Sons, and Maxim have launched at Barrow the sixth submarine built for the British Admiralty. She is 100 ft. long, compared with 63 ft. in the case of the first five vessels, and possesses greater speed and many improvements which the trials of the earlier submarines have suggested.

Messrs. John I. Thornycroft and Co. (Limited), Chiswick, launched from their works on 22nd ult. a first-class torpedo-boat, which will be known as No. 109. At the latter end of last year the firm received an order for five vessels closely resembling the four built by them in 1901, and No. 109 is the first of them to leave the ways.

The Royal Naval Engineering College, Keyham, which has hitherto been under the control of the Admiral-Superintendent of Devonport Dockyard, is in future to be under the direct control of the Commander-in-Chief of the port. The work of the engineer students in the dockyard workshops is still to be regulated by the dockyard officials.

The *Good Hope*, armoured cruiser, is to be ready for commissioning at Portsmouth by September 30 as flagship of Rear-Admiral W. H. Fawkes, who will assume command of the Home Cruiser Squadron, and the *King Alfred*, armoured cruiser, which is preparing for her steam trials, is to be ready for commissioning at Portsmouth by November 30.

The Lords Commissioners of the Admiralty have awarded a Good Service pension of £150 a year to each of the following

officers:—To Captain Arthur C. Clarke, R.N., in the vacancy caused by the promotion of Captain Gerald C. Langley, R.N., and to Captain Richard W. White, R.N., in the vacancy caused by the retirement of Captain Henry C. Bigge, R.N.

The *British Medical Journal* states:—"We are informed that a complete X-ray outfit has been ordered, at a cost of £67. 18s. 6d., for all flagships. Almost all His Majesty's ships are now supplied with electric light plant, which will be available for such an outfit. Naval hospitals have recently been supplied with Röntgen ray apparatus, and instruction is now given to surgeons in the work."

The *Hercules*, battleship, was temporarily commissioned at Portsmouth on the 16th ult. by Captain J. M. De Robeck, who will transfer his pennant to the *Warrior* when the refit of that ship is completed. The *Warrior*, which will then become the parent ship of the torpedo craft in the Portsmouth Reserve, will be moored in Fountain Lake, where a basin 26 ft. in depth has been dredged out of the mud for her accommodation.

The Belleville water-tube boiler is finally condemned for the purposes of the Navy in the report of Admiral Donville's Committee, which was issued by the Admiralty last night. Since the interim report was published comparisons have been made with the *Hyacinth* (carrying Belleville boilers) and the *Minerva* (with cylindrical boilers), and a full-power trial was made with the *Diadem*, which also has Belleville boilers. The result is to confirm the opinion previously expressed that, while satisfactory water-tube boilers are preferable to cylindrical, the Belleville type cannot be recommended for the Navy.

Vice-Admiral Sir T. S. Jackson relinquished his appointment on the 11th ult., as Admiral-Superintendent of the Devonport Dockyard, and handed over the command to Rear-Admiral W. H. Henderson. Admiral Lord Charles Scott, Commander-in-Chief at Plymouth, accompanied by his staff and also the principal naval officers and Admiralty officials at Devonport, assembled at the railway station on the departure of Sir Thomas and Lady Jackson for London. Lady Jackson was presented with a basket of flowers by the wives of dockyard officers. During the day the new Admiral-Superintendent met the heads of departments.

Nos. 3 and 4 submarine boats returned to Barrow Docks, after about eight hours' trial in the Irish Sea. The experiments, which were carried out on a measured mile, included surface and submerged tests, and in every respect these gave the greatest satisfaction. No. 3 boat underwent her preliminary trials at sea some days ago, but this was the first occasion on which the fourth boat had been taken out of the docks. Her accomplishments were on the same satisfactory scale as her predecessor's, and seeing that four of the boats building at Barrow have so far proved successful, it is expected work will at once be commenced for the construction of the four additional boats included in the last naval programme.

The *Odin*, sloop, built at Sheerness Dockyard and engined by the Wallsend Slipway and Engineering Company, returned to Sheerness Harbour on the 8th ult. from a 30-hours' coal consumption trial in the Channel, which proved successful. The machinery was worked at three-fourteenths the maximum horse power, and the particulars were as follows:—Pressure of steam in boilers, 208 lb.; ditto at engines, 201 lb.; vacuum—starboard, 26.6 in.; port, 26.7 in.; revolutions—starboard, 122; port, 121; i.h.p.—starboard, high, 51; intermediate, 47; low, 54—total, 152; port, high, 47; intermediate, 45; low, 64—total, 156; aggregate starboard and port, 308 i.h.p.; speed, 9.4 knots; coal consumption, 1.52 lb. per i.h.p. per hour. The *Odin*, which is fitted with the Babcock and Wilcox water-tube boilers, left Sheerness on Thursday, the 10th ult., for a 30-hours' steam trial of 1,000 h.p.

The *Powerful*, cruiser, has completed a two-hours' full-power trial after repair. Sufficient power was obtained an hour-and-a-half after starting, and the mean i.h.p. of the two hours was 23,508, while in the last hour it rose to nearly 25,000. The mean speed was 21.2, and in the last half-hour 21.6 knots was reached. The result compares favourably with the official contract trials some years ago, when with 25,886 h.p. she made a speed of 21.8 knots. At the contract trial, however, she had a mean draught of 27 ft. 6 in., and at her trial after repair a draught of 28 ft. 9 in., her load having been increased by the addition of four 6-in. quick-firing guns, which were also tried before the vessel went on her speed run. The mean of the revolutions at the two-hours' trial was 108.8, against 114 at the contract trial, and the steam in boilers was 235 lb., against 257 lb. The boilers, which have been in the ship seven years, gave no trouble of any kind.

Chili.—According to the Valparaíso correspondent of the *Times*, the Chilean Government states that the British Government has offered to take over next year the ships under construction for Chili.

Holland.—The Dutch Minister of Marine, in reply to a recent question asked in the States-General as to what form of boiler he proposed to adopt for their new ships, stated that he intended to adhere to the boilers of the Yarrow type, which had many advantages over all others, the disadvantages having gradually diminished or disappeared by experience.

Russia.—The *Yuzhnaya Rossiya* (South Russia) publishes the following particulars of the new Russian battleship, *Kniaz Potemkin Tavricheski*. She was begun in the Admiralty yards, Nikolaiëff, on December 27, 1897, launched October 9, 1900, and commissioned June 21 this year. Her length over all is 378 ft. 6 in., and at the water-line 371 ft. 2½ in.; beam, 73 ft.; draught, 27 ft.; displacement, 12,600 tons; engines, 10,600 horse-power; speed, 16 knots. She is fitted with Belleville boilers, the two groups aft being heated by coal and the one group forward by petroleum. Of coal she carries 670 tons and of petroleum 580 tons, which together give her a radius of 3,393 miles at a speed of 9.3 knots. She is an improved type of the *Tri Sviatitelia* (Three Patriarchs). Her armour extends 237 ft. along the load-line on each side, with a thickness of 8 in. and 9 in., and is continued to the ends fore and aft with a thickness of 3 in.; at the lower casemates it is 6 in. thick, with a run of 156 ft. on each side; and at the upper casemates, or battery, for a length of 168 ft. on each side, the thickness is 5 in. The bulkheads at the terminations of the above-named armour are respectively 7 in., 6 in., and 5 in. in thickness. The lower steel deck is 2 in. thick, with armour-plates 1½ in. on the horizontal and 1½ in. on the sloping parts; it extends as far as the armour-belt. All the armour is of Krupp steel, made in Russia at the Izhoroski works. The upper armour deck has a thickness of 1½ in. The armament consists of four 12-in. Canet guns of 40 calibres, sixteen 6-in. Canet guns of 45 calibres, fourteen 2.95-in. Canet guns, six 1.85 Hotchkiss guns, six machine guns, two Baranovski landing guns, and five submerged torpedo-tubes—one at the bows and four broadside.

The *Kronstadtski Viestnik* states that the refitting of the battleship *Imperator Alexander II.* and of the cruiser *Pamiat Azova* has been postponed till the winter of 1903. Both vessels will be used next year as gunnery training ships. The new Russian cruiser *Oleg*, having a speed of 23 knots, has been launched at St. Petersburg simultaneously with the new battleship *Orel*.

United States.—According to the Washington correspondent of the *Mail and Express*, Mr. Moody, Secretary of the Navy, has stopped action on the plans for the construction of

naval coaling stations on the Pacific coast while awaiting the results of the experiments which the navy is making in the use of oil as fuel. Mr. Moody believes that these experiments will show that oil is a cheaper, cleaner, and better fuel for the navy than coal. If the experiments prove successful, oil-tank stations will come into use instead of coaling stations.

MILITARY.

Lieut. J. B. Arbuthnot, 3rd Scots Guards, Signalling Officer of the Home District, is to be appointed Aide-de-Camp to Sir H. A. Blake, Governor of Hong Kong.

Major-General Lord Dundonald left England on July 15, to take up the command of the Canadian Militia, and will be joined by Lady Dundonald at Ottawa in the early winter.

Colonel A. W. Collard, Army Service Corps, has been appointed A.A.G. Eastern District at Colchester, in succession to Colonel R. D. Noakes.

G Battery, Royal Horse Artillery, instead of coming home, is to proceed to India from South Africa, and will be stationed at Bangalore.

Lieut.-Colonel Briston, R.E., D.S.O., now commanding the Royal Engineers at Bloemfontein, has been selected to command the Royal Engineers at Aldershot.

Major-General R. B. Lane, C.B., has left Malta for England on leave. Major-General D. D. T. O'Callaghan will administer the Government until the return of General Lord Grenfell.

Captain M. J. J. Sweetman, 1st Battalion Worcestershire Regiment, has been selected to succeed Major E. E. Hanbury, Scots Guards, as Superintendent of Gymnasia in London and the Home District.

Lieut.-Colonel Battersby, Deputy Assistant Director-General of Ordnance, has been approved for Assistant Director-General, to succeed Colonel C. G. Jeans, who is to be appointed Ordnance Officer, First Class.

Brigadier-General the Hon. Sir F. W. Stopford, Chief Staff Officer at Aldershot, has been appointed President of the Establishment and Loads Committee, in place of Colonel C. H. Bridge, Assistant Adjutant-General.

Lieut.-Colonel H. M. Sinclair, R.E., has been selected for appointment as Commanding Royal Engineer, Woolwich District, in place of Brevet-Colonel H. L. Jessop, who vacated the appointment.

The Commander-in-Chief has approved of Major-General Sir Henry Trotter's retaining command of the Home District till December 21, and also of Colonel Purcell's remaining as assistant commandant of the School of Military Engineering, Chatham, till the end of September.

Lieut.-Colonel E. S. E. Childers, C.B., Royal Engineers, has been selected for appointment as Commanding Royal Engineer, Woolwich District, vice Lieut.-Colonel H. L. Jessop, who will complete his five years' service as a regimental lieutenant-colonel on the 27th inst., when he will be placed on half-pay.

Colonel John G. Glancy, half-pay list, late Leinster Regiment, has been selected for the command of the 10th Regimental District (Leinster Regiment) at Birr, in succession to Colonel H. W. Trench, retired. The 10th Regimental District, which consists of the counties of Meath, Westmeath, Longford, and the King's and Queen's counties, is now included in the Belfast command.

The Reservists and time-expired men of the 1st and 2nd Battalions Coldstream Guards, who arrived in London from South Africa on the 21st ult., after 2½ years' active service, received the following telegram despatched from Cowes from His Majesty the King:—"The King, as Colonel-in-Chief of the Coldstream Guards, welcomes home the men of the regiment on their return from South Africa, and assures them that he fully appreciates the splendid services they have rendered during this long and arduous campaign."

STATISTICAL NOTES.

Australia (Queensland).—TRADE OF QUEENSLAND, FIRST QUARTER OF 1902.—The Board of Trade have received from the Collector of Customs at Brisbane a copy of the Customs statistics of Queensland giving preliminary figures, showing the value of the trade of that State during the quarter ended 31st March last, as compared with the corresponding period of the previous year, as follows:—

	Quarter ended 31st March.	
	1901.	1902.
Total value of Imports *	1,602,422	1,728,073
" Exports *	1,599,756	1,890,942
Principal Exports:—		
Gold	579,202	607,210
Hides and skins	79,632	92,406
Meat, preserved and frozen	175,165	331,782
Pearl shell and beche de-mer	19,940	32,480
Sugar	25,707	141,910
Tallow	37,384	59,601
Tin	11,705	23,393
Wool	503,498	295,186
Green fruit	18,949	26,427

* Exclusive of live-stock borderwise.

Japan.—TRADE.—The following tables showing the trade of Japan are taken from the annual report of the Yokohama Chamber of Commerce:—

I.—TABLE OF TOTAL VALUE OF IMPORTS FROM THE VARIOUS COUNTRIES DURING THE YEARS 1901 AND 1900.

	1901.	1900.
	Yen.	Yen.
From Great Britain	50,575,788	71,638,219
" India	42,779,904	23,516,350
" China	27,256,986	29,960,740
" United States	42,769,429	52,761,196
" Germany	28,320,101	29,199,695
" Hong Kong	11,141,788	10,659,855
" Anam, Tonkin, etc.	4,082,897	3,632,342
" Corea	10,052,438	8,805,618
" France	3,752,828	8,095,819
" Belgium	5,810,806	7,949,253
" Philippine Islands	2,981,031	2,284,293
" Switzerland	2,208,574	3,012,504
" Russia, Asiatic	4,515,165	5,716,705
" Russia, European	210,275	309,227
" Australia	1,777,598	2,455,939
" Other countries	37,680,746	20,162,090
Total	Yen 255,816,644	Yen 290,159,845

II.—TABLE OF TOTAL VALUE OF EXPORTS TO VARIOUS COUNTRIES DURING THE YEARS 1901 AND 1900.

	1901.	1900.
	Yen.	Yen.
To United States	72,309,358	52,566,395
" France	27,275,271	19,150,422
" Hong Kong	41,786,647	39,177,455
" China	42,925,579	31,871,576
" Great Britain	11,482,503	11,262,997
" India	9,657,594	8,704,318
" Corea	11,372,550	9,953,271
" Italy	12,569,484	7,129,310
" Germany	5,251,070	3,555,613
" Canada	3,276,114	2,950,662
" Russia, Asiatic	2,290,446	3,541,833
" Russia, European	852,315	623,325
" Austria	1,386,963	497,194
" Switzerland	150,284	117,877
" Hawaii	1,902,709	1,294,789
" Australia	2,533,357	2,530,534
" Egypt	308,145	277,953
" Other countries	25,081,754	2,858,032
Total	Yen 252,349,543	Yen 198,063,546

III.—PARTICULARS OF TRADE OF JAPAN FOR THE YEARS 1892, 1897 AND 1901; COMPILED FROM THE ANNUAL RETURNS OF THE IMPERIAL CUSTOMS.

	1892.	1897.	1901.
	Yen.	Yen.	Yen.
Raw Cotton	12,324,655	43,620,214	59,641,602
COTTON MANUFACTURES:—			
Yarns	7,131,980	9,625,258	4,869,523
Shirtings, Grey	1,727,186	3,783,809	2,990,179
Turkey Red Cambrics	378,336	494,593	188,585
Velvets	578,374	677,051	832,134
Other Manufactures	2,150,344	4,912,677	6,272,936
WOOLLEN MANUFACTURES:—			
Woolen	1,073,743	1,187,656	779,329
Mousselines	2,448,900	3,835,881	3,333,656
Italian Cloth	1,062,572	1,815,582	601,439
Cloth	837,035	2,234,075	1,970,272
Blankets	528,973	608,928	76,722
Other Manufactures	1,036,942	2,995,248	2,146,508
METALS:—			
Iron	1,577,612	10,075,086	19,970,599
Other Metals and Manufactures	3,412,968	10,314,774	5,435,967
Kerosene	3,328,398	7,667,350	14,899,100
Sugar	9,604,350	20,003,101	33,529,802
Arms and Munitions	1,072,248	505,949	24,370
Steam Vessels	431,875	8,235,733	2,565,893
Miscellaneous Imports	20,603,285	86,707,337	95,688,028
Total	Yen 71,324,776	Yen 219,300,772	Yen 255,816,644

	1892.	1897.	1901.
	Yen.	Yen.	Yen.
Silk, Raw	36,269,744	55,630,460	74,667,330
Waste Silk and Pierced Cocoons	3,641,425	3,052,623	4,468,768
Silkworm Eggs	3,790	20	...
Tea and Tea Dust	7,525,316	7,860,460	8,854,326
Tobacco	95,820	351,740	38,334
Rice	4,108,732	6,145,250	6,908,912
Wheat	1,119	5,504	3,319
Copper	4,897,853	5,774,699	14,037,683
Fish Oil	248,621	618,478	1,023,631
Vegetable Wax	285,507	730,576	610,370
Camphor	1,274,753	1,318,292	3,904,973
Coal	4,571,994	11,545,801	17,542,273
Silk Handkerchiefs	3,494,417	3,390,146	3,951,191
Silk Piece-goods	4,434,078	9,839,332	25,608,738
Cotton Yarn	7,720	13,490,197	21,465,572
Miscellaneous Exports	20,241,801	43,381,499	69,264,113
Total	Yen 91,102,750	Yen 163,135,977	Yen 252,349,543

United Kingdom.—TRADE FOR THE FIRST SIX MONTHS OF 1902.—The following tables show the value of the Imports from foreign countries and British possessions for the six months ended the 30th June last, as compared with the corresponding periods of the two previous years:—

	Imports from Foreign Countries and British Possessions.		
	Six months ended 30th June.		
	1900.	1901.	1902.
	£	£	£
I. Animals, living (for food)	4,616,979	4,706,663	3,938,487
II. (a) Articles of food and drink, duty free	44,808,268	47,929,325	48,511,821
(b) Articles of food and drink, dutiable	51,240,782	56,289,039	53,781,292
Tobacco, dutiable	2,027,518	1,882,152	2,064,315
III. Metals	15,748,531	14,642,082	15,583,350
IV. Chemicals, dyestuffs, and tanning substances	3,179,215	3,462,687	3,343,778
V. Oils	5,366,271	5,407,302	5,688,990
VI. Raw materials for textile manufactures	42,497,888	45,232,958	44,868,399
VII. Raw materials for sundry industries and manufactures	28,446,645	26,165,777	24,732,447
VIII. Manufactured articles	48,682,316	47,851,799	49,166,474
IX. (a) Miscellaneous articles	8,430,671	8,149,196	10,429,238
(b) Parcel post	611,915	697,810	631,497
Total value	£255,656,999	£262,416,790	£262,740,088

NOTE.—Sugar and other cognate articles became liable to duties on the 19th April, 1901, and are included in Section II. (b) of the above table. Corn, grain, flour, etc., which became subject to duty on and after the 15th April, 1902, are, for this month, included in Section II. (a).

The value of the Exports of home produce and of foreign and colonial produce during the first six months of 1902, as compared with like periods of 1901 and 1900, is as shown in the subjoined table:—

	EXPORTS OF BRITISH AND IRISH PRODUCE AND MANUFACTURES.		
	£	£	£
I. Animals, living	394,183	298,282	320,604
II. Articles of food and drink	5,709,638	6,168,062	6,556,527
III. Raw materials	19,199,544	16,637,790	14,522,870
IV. Articles manufactured and partly manufactured, viz:—			
(a) Yarns and textile fabrics	51,897,128	51,157,522	51,072,823
(b) Metals and articles manufactured therefrom (except machinery and ships)	24,021,181	19,785,572	19,589,683
(c) Machinery and mill-work	9,846,105	9,054,073	9,031,606
(d) Ships, new (not registered as British)	3,940,113	4,973,570	3,053,256
(e) Apparel and articles of personal use	4,724,950	5,249,194	5,360,767
(f) Chemicals and chemical and medicinal preparations	5,080,097	4,672,126	4,953,227
(g) All other articles, either manufactured or partly manufactured	18,202,385	18,866,614	19,124,465
(h) Parcel post	1,361,440	1,717,593	1,789,746
Total value	£144,376,764	£138,580,398	£135,375,574

	EXPORTS OF FOREIGN AND COLONIAL PRODUCE.		
	£	£	£
Total value	33,421,021	34,082,626	32,818,842

METRICAL WEIGHTS AND MEASURES.

TABLES FOR CONVERTING METRICAL WEIGHTS AND MEASURES.

HEC- TARE.	ACRE.	KILO- MÈTRE.	ENG. MILE.	SQUARE KILO- MÈTRE.	ENG. MILE.
0'405	1	2'471	1'609	1	0'386
0'809	2	4'942	3'219	2	0'772
1'214	3	7'413	4'828	3	1'158
1'619	4	9'885	6'438	4	1'544
2'023	5	12'356	8'047	5	1'930
2'428	6	14'827	9'656	6	2'316
2'833	7	17'298	11'265	7	2'702
3'237	8	19'769	12'879	8	3'088
3'642	9	22'240	14'484	9	3'474
4'047	10	24'711	16'093	10	3'860
4'452	11	27'182	17'702	11	4'246
4'856	12	29'653	19'311	12	4'632
5'261	13	32'124	20'920	13	5'018
5'665	14	34'595	22'529	14	5'404
6'070	15	37'066	24'138	15	5'790
6'474	16	39'537	25'747	16	6'176
6'879	17	42'008	27'356	17	6'562
7'283	18	44'479	28'965	18	6'948
7'688	19	46'950	30'574	19	7'334
8'092	20	49'421	32'183	20	7'720
8'497	21	51'892	33'792	21	8'106
8'899	22	54'363	35'401	22	8'492
9'304	23	56'834	37'010	23	8'878
9'708	24	59'305	38'619	24	9'264
10'113	25	61'776	40'228	25	9'650
10'517	26	64'247	41'837	26	10'036
10'922	27	66'718	43'446	27	10'422
11'326	28	69'189	45'055	28	10'808
11'731	29	71'660	46'664	29	11'194
12'135	30	74'131	48'273	30	11'580
12'540	31	76'602	49'882	31	11'966
12'944	32	79'073	51'491	32	12'352
13'349	33	81'544	53'100	33	12'738
13'753	34	84'015	54'709	34	13'124
14'158	35	86'486	56'318	35	13'510
14'562	36	88'957	57'927	36	13'896
14'967	37	91'428	59'536	37	14'282
15'371	38	93'899	61'145	38	14'668
15'776	39	96'370	62'754	39	15'054
16'180	40	98'841	64'363	40	15'440
16'585	41	101'312	65'972	41	15'826
16'989	42	103'783	67'581	42	16'212
17'394	43	106'254	69'190	43	16'598
17'798	44	108'725	70'799	44	16'984
18'203	45	111'196	72'408	45	17'370
18'607	46	113'667	74'017	46	17'756
19'012	47	116'138	75'626	47	18'142
19'416	48	118'609	77'235	48	18'528
19'821	49	121'080	78'844	49	18'914
20'225	50	123'551	80'453	50	19'300
20'630	51	126'022	82'062	51	19'686
21'034	52	128'493	83'671	52	20'072
21'439	53	130'964	85'280	53	20'458
21'843	54	133'435	86'889	54	20'844
22'248	55	135'906	88'498	55	21'230
22'652	56	138'377	90'107	56	21'616
23'057	57	140'848	91'716	57	22'002
23'461	58	143'319	93'325	58	22'388
23'866	59	145'790	94'934	59	22'774
24'270	60	148'261	96'543	60	23'160
24'675	61	150'732	98'152	61	23'546
25'079	62	153'203	99'761	62	23'932
25'484	63	155'674	101'370	63	24'318
25'888	64	158'145	102'979	64	24'704
26'293	65	160'616	104'588	65	25'090
26'697	66	163'087	106'197	66	25'476
27'102	67	165'558	107'806	67	25'862
27'506	68	168'029	109'415	68	26'248
27'911	69	170'500	111'024	69	26'634
28'315	70	172'971	112'633	70	27'020
28'720	71	175'442	114'242	71	27'406
29'124	72	177'913	115'851	72	27'792
29'529	73	180'384	117'460	73	28'178
29'933	74	182'855	119'069	74	28'564
30'338	75	185'326	120'678	75	28'950
30'742	76	187'797	122'287	76	29'336
31'147	77	190'268	123'896	77	29'722
31'551	78	192'739	125'505	78	30'108
31'956	79	195'210	127'114	79	30'494
32'360	80	197'681	128'723	80	30'880
32'765	81	200'152	130'332	81	31'266
33'169	82	202'623	131'941	82	31'652
33'574	83	205'094	133'550	83	32'038
33'978	84	207'565	135'159	84	32'424
34'383	85	210'036	136'768	85	32'810
34'787	86	212'507	138'377	86	33'196
35'192	87	214'978	140'000	87	33'582
35'596	88	217'449	141'609	88	33'968
36'001	89	219'920	143'218	89	34'354
36'405	90	222'391	144'827	90	34'740
36'810	91	224'862	146'436	91	35'126
37'214	92	227'333	148'045	92	35'512
37'619	93	229'804	149'654	93	35'898
38'023	94	232'275	151'263	94	36'284
38'428	95	234'746	152'872	95	36'670
38'832	96	237'217	154'481	96	37'056
39'237	97	239'688	156'090	97	37'442
39'641	98	242'159	157'699	98	37'828
40'046	99	244'630	159'308	99	38'214
40'450	100	247'101	160'917	100	38'600

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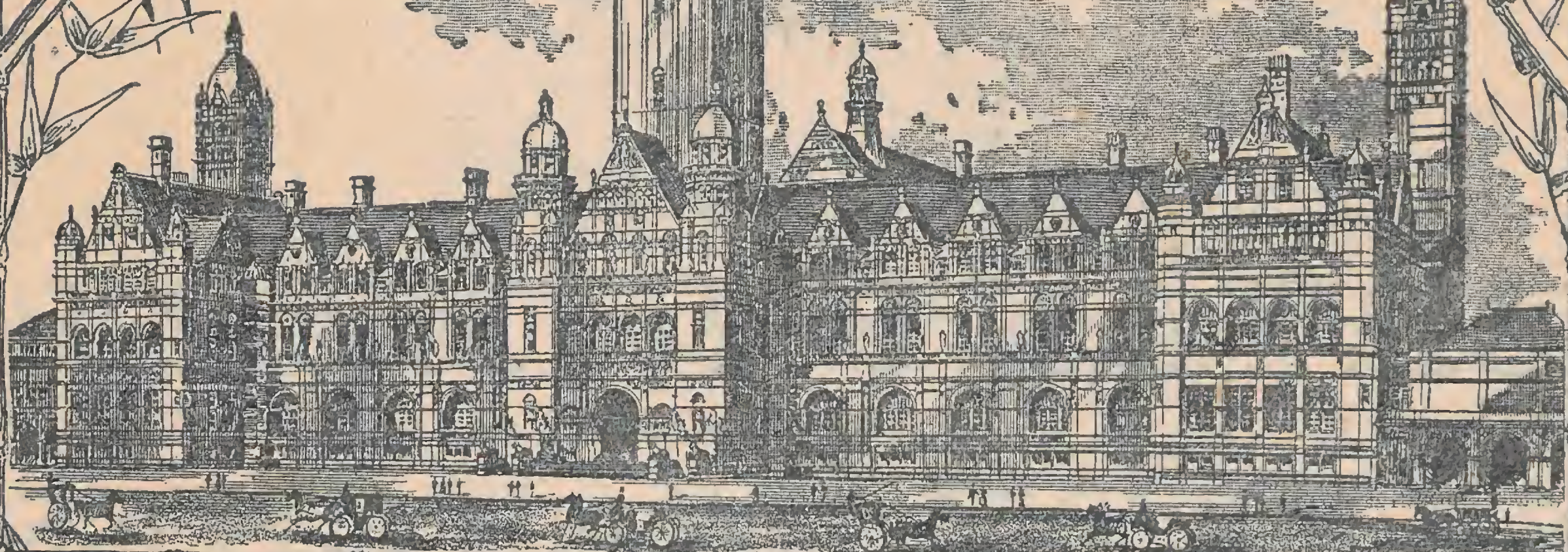
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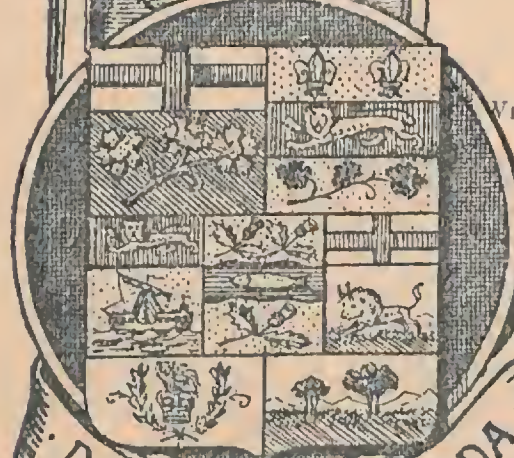
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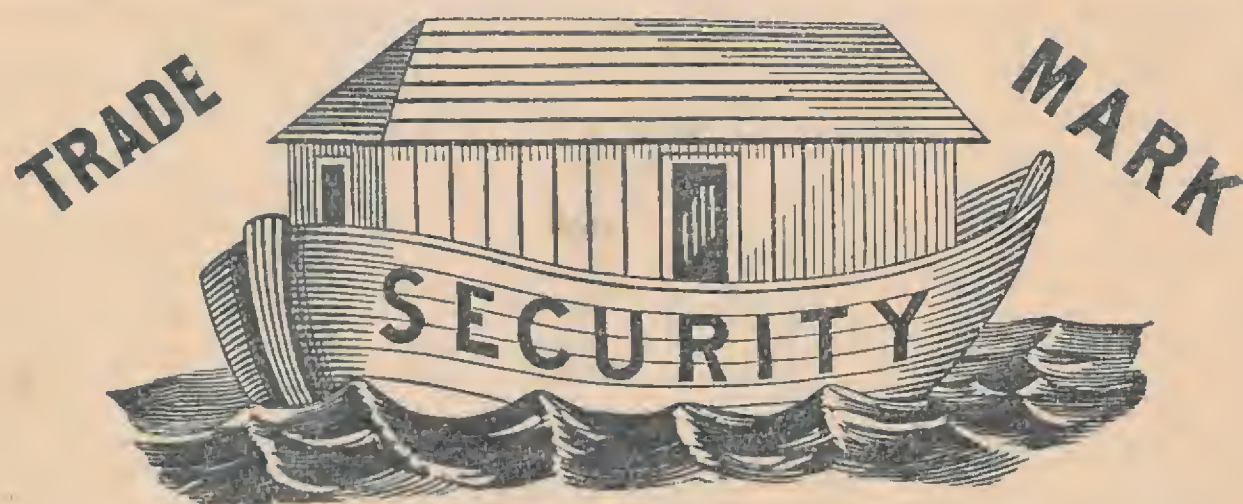
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WESTERN AUSTRALIA. (East Central Lower Gallery.)

Representative Governor.—The Hon. H. B. LEFROY (Agent-General).

Corresponding Agent in Colony.—(At present through Agent-General's Office.)

Curator of Collection.—(In charge of Institute Staff.)

Products Exhibited.—Wools, gums and resins, olive oil, fibrous barks, silk, skins, indigenous woods, minerals, model gold ingots, etc., etc.

TASMANIA. (East Central Lower Gallery.)

Representative Governor.—The Hon. ALFRED DOBSON (Agent-General).

Corresponding Agent in Colony.—Mr. T. C. JUST, Chief Secretary's Office, Hobart.

Curator of Collection.—(In charge of Institute Staff.)

Products Exhibited.—Cereals, minerals, models of fruits, stuffed fish, furs, timbers, illustrations of local manufactures, etc., etc.

NEW ZEALAND. (East Central Lower Gallery.)

Representative Governors.—The Hon. W. P. REEVES (Agent-General), and THOMAS MACKENZIE, Esq. *Corresponding Agent in Colony.*—(At present through Agent-General's Office.) *Curator of Collection.*—(In temporary charge of Institute Staff.)

Products Exhibited.—Agricultural produce, building stones, coal, Kauri gum, hemp and flax, tinned meats, wools, tobacco, Kauri and other woods, with illustrations of their application to structural and ornamental purposes; photographs, etc., etc.

FIJI. (Middle of Central Lower Gallery.)

Representative Governor.—Gen. SIR ROBERT BIDDULPH, G.C.B., G.C.M.G.

Corresponding Agent in Colony.—Hon. JOHN HILL, Suva.

Curator of Collection.—(In charge of Institute Staff.)

Products Exhibited.—Barks, fibres, copra, tea, cocoa, coffee, timbers, etc.

BRITISH INDIA (AND ASIA).

INDIA (East Gallery and Pavilion.)

Representative Governors.—Vide p. 228.

Special Sub-Committee, in charge of the Indian Section (appointed by the Secretary of State for India in Council):—*Chairman:* Major-General SIR OWEN TUDOR BURNE, G.C.I.E., K.C.S.I.

Members: SIR GEORGE C. M. BIRDWOOD, K.C.I.E., C.S.I.; G. W. VIDAL, Esq., I.C.S.; SIR E. C. BUCK, K.C.S.I.; W. COLDSTREAM, Esq., I.C.S., B.A.; C. H. MOORE, Esq.; T. W. HOLDERNESS, Esq., C.S.I.; SIR CHARLES J. LYALL, K.C.S.I., C.I.E.; Major-General JAMES WATERHOUSE.

Secretary: Mr. J. R. ROYLE, C.I.E.

Channel of Correspondence.—THE REVENUE AND AGRICULTURAL DEPARTMENT, INDIA.

Curator of Collection.—Mr. J. R. ROYLE, C.I.E.

Products Exhibited.—Fodder grasses, foods and food stuffs, sugar, spices and condiments, models of fruits, narcotics (including opium, ganja, etc.), tobacco and cigars, tea and coffee, oils and oil-seeds (including those of castor, sesamum, linseed, cocoa-nut and ground nut, etc.), a large assortment of drugs, dyes and tans, gums and resins (including the resins and turpentine of Indian pines, wax, lac, etc.), an extensive collection of fibres (including cotton, silk, jute, coir, rhea, agave, etc.), models illustrating the manufacture of cotton and jute, minerals (including building stones, coal, mica, soapstone, corundum, iron ores, steel, etc.), timbers, collection of Indian pottery, carved woodwork, silver, brass and copper ware, silk and cotton fabrics.

CEYLON. (East Gallery.)

Representative Governor.—The Rt. Hon. the LORD STANMORE, G.C.M.G.

Executive Officer and Home Agent.—FREDK. H. M. CORBET, Esq., Barrister-at-Law.

Curator of Collection.—Mr. J. R. ROYLE, C.I.E.

Products Exhibited.—Cereals, pulses, edible fruits, roots and grains, spices and condiments, drugs, horns, skins, pearls, shells, wax, oils, gums, resins, dyes, tans, fibres, timbers, building stones, plumbago, metallic ores, rough gems, palm products, tea, coffee, cocoa, cinchona bark, sugar, tobacco, cotton-cloth, mats, rattan and basket work, wood and ivory carving, metal-work, pottery, tortoise-shell and porcupine quill work, lacquer work, lace, etc., etc.

STRAITS SETTLEMENTS (AND JOHOR).

(East Gallery.)

Representative Governor.—SIR CECIL CLEMENTI SMITH, G.C.M.G.

Corresponding Agents.—The COLONIAL SECRETARY (at Singapore); The Dato JAMES MELDRUM (for Johor). *Curator of Collections.*—(In charge of Institute Staff.)

Products Exhibited.—Barks, canes, drugs, fibres, preserved fruits (including Singapore pine-apples), mats, silk fabrics, oils and oil-seeds, dyes and tans, gums, gutta-percha, tin ores and other minerals, teas, coffee, spices, timbers, etc., etc.

MAURITIUS (AND SEYCHELLES).

(West Central Lower Gallery.)

Representative Governor.—[VACANT.]

Corresponding Agent in Colony.—Mr. A. DARUTY DE GRANDPRÉ, Museum Superintendent

Corresponding Agent for Seychelles.—The Hon. E. B. SWEET-ESCOTT, C.M.G., Administrator

Curator of Collection.—(In charge of Institute Staff.)

Products Exhibited.—Fibres, hemp, oils, rum, seeds, sugars, tortoise-shell, vanilla beans, with specimens of native workmanship, etc., etc.

HONG KONG. (Middle of Central Lower Gallery.)

Representative Governor.—SIR WILLIAM ROBINSON, G.C.M.G.

Corresponding Agent in Colony.—The HARBOUR MASTER.

Curator of Collection.—(In charge of Institute Staff.)

Products Exhibited.—China, carved and inlaid ivory and wood-work, silver and lacquer ware, silk and cotton fabrics, drugs, paints, dyes, food stuffs, etc., etc.

BRITISH NORTH BORNEO. (West Central Lower Gallery.)

Corresponding Agent.—(At present through the British North Borneo Co.)

Curator of Collections.—(In charge of Institute Staff.)

Products Exhibited.—Timbers, rattans, coal, rice, sago, sugarcane and raw sugar coffee, cocoa pods, pepper, tobacco, camphor, gutta-percha, kapok fibre dammars, cutch and gambier, hemp, honey, etc.

BRITISH POSSESSIONS (EUROPE)

MALTA, GIBRALTAR, AND CYPRUS.

(West Central Gallery.)

Representative Governor.—Gen. SIR ROBERT BIDDULPH, G.C.B., G.C.M.G.

Corresponding Agent.—(At present through the Representative Governor.)

Curator of Collections.—(In charge of Institute Staff.)

Products Exhibited.—From Malta—Carved stone-work, lace, macaroni, honey, various fabrics, models, pictures, etc., etc. Gibraltar and Cyprus—None at present.

IMPERIAL INSTITUTE JOURNAL.

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GENERAL NOTICES.

"THE IMPERIAL INSTITUTE JOURNAL."

Fellows resident in the United Kingdom, the Colonies, India, and Foreign Countries, are supplied with the JOURNAL free by post each month.

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The JOURNAL may also be purchased for **Sixpence** each copy at the Ticket Office of the Institute and at the railway book-stalls of Messrs. WILLING & Co.

The City Agents for the JOURNAL are Messrs. WILLING & Co., 17, Royal Exchange, London, E.C. It may also be obtained at the offices of the printers, WATERLOW & SONS LIMITED, Blomfield-house, London-wall, London, E.C.

Communications respecting Advertisements should be addressed to the ADVERTISEMENT MANAGER, 6, Arundel-street, Strand, London, W.C.

This JOURNAL is distributed (by post) throughout the United Kingdom, India, and the Colonies of the British Empire, and to the following Foreign Countries:—Argentina, Republic, Austria-Hungary, Belgium, Bolivia, Chili, China, Colombia, Costa Rica, Denmark, Egypt, France, Germany, Greece, Hawaiian Islands, Holland, Italy, Japan, Mexico, Montenegro, Morocco, Norway, Persia, Peru, Portugal, Russia, Siam, Spain, Sweden, Switzerland, Tripoli, Turkey, United States of America, Uruguay, and Venezuela. The JOURNAL is also placed in the Reading Rooms of CHAMBERS OF COMMERCE, CLUBS, and HOTELS, both at home and abroad.

IMPORTANT NOTICE

TO

ANNUALLY PAYING FELLOWS.

The Bill transferring the property and Government of the Imperial Institute to the Nation has become Law.

After the 1st of January, 1903—when the Act comes into operation—subscribing Fellows will cease to exist as such.

It is suggested that any standing orders that may have been given to Bankers or Agents for the payment of the annual Fellow's subscription should be cancelled. A continuance of the enjoyment of privileges of Fellowship will be secured to those now on the Roll of Life Fellows of the Institute, but no new Life Fellows will be elected.

A copy of "The Imperial Institute (Transfer) Act, 1902," is given on page 233.

SPECIAL EXHIBITION OF COLONIAL PRODUCTS AND INDUSTRIES.

A Special Exhibition of Collections illustrative of the Mineral Wealth and of certain Industries of the DOMINION OF CANADA, also of commercial products from QUEENSLAND, RHODESIA, WESTERN AUSTRALIA, and BRITISH NORTH BORNEO, is on view in the western half of the North Gallery, from 11 a.m. to 5 p.m., on week-days—**Admission Free.**

COMMERCIAL COLLECTIONS.

The Galleries containing the Colonial and Indian Collections, and the Public Commercial and Industrial News Room, are open for free inspection by the public daily, *except Sundays, and any days specially notified*, from 11 a.m. until 5 p.m. Every information concerning the products, their supply, etc., can be obtained on application to the Curators of the Indian and Ceylon, Canadian, and South African Sections, to the general Curator, and to the Commercial Intelligence Department.

FELLOWS' DEPARTMENT.

The Reading, Writing, and News Rooms, are open for the use of Fellows every week-day from 10 a.m. till 11.30 p.m., and on Sundays from 3 p.m. to 10.30 p.m. The Library (on the First Floor), is open from 10 a.m. to dusk on Week-days, and from 3 p.m. to dusk on Sundays. The Map Room (First Floor) is open from 10 a.m. to 5 p.m. on Week-days.

The Poste Restante is open every week-day for receipt and delivery of letters and parcels. Letters addressed to initials only are not received, except in reply to notices in the JOURNAL, under "Requirements" Registry. The General Post Office Pillar Box is cleared daily twelve times, between 10.10 a.m. and midnight. Light refreshments only are, for the present, provided in the Fellows' Rooms and at the bar of the Ceylon Kiosk.

EMIGRATION INFORMATION OFFICE.

The Office of the British Women's Emigration Association (see page 246), in the West Corridor, First Floor, is open daily from 10 a.m. to 4 p.m., and advice and information respecting emigration and openings in the Colonies may be obtained there free of charge. Enquiries of all kinds relating to the Colonies from intending Emigrants are dealt with in the Commercial Intelligence Department, and special information respecting Canada and the Cape Colony may also be obtained from the Curators for these Colonies, on application personally at their offices, or by letter.

SCIENTIFIC AND TECHNICAL DEPARTMENT.

The Scientific and Technical Department of the Institute has been established to acquire information by special enquiries and by experimental research, technical trials and commercial valuation regarding new or little known natural or manufactured products of the various Colonies and Dependencies of the British Empire and of foreign countries, and also regarding known products procurable from new sources, and local products of manufacture which it is desired to export. This work is carried out with a view to the creation of new openings in trade, or the promotion of industrial developments.

In the extensive and well-equipped series of Research Laboratories occupying the West Corridor of the Second Floor, a staff of skilled Chemists, under the direction of Professor Wyndham R. Dunstan, M.A., F.R.S., carry out the investigation of the chemical constitution and properties of new dye-stuffs, tanning materials, seeds and food-stuffs, oils, gums and resins, fibres, timbers, medicinal plants and products; animal products, minerals and ores, soils, cements, and various other products, with a view to their commercial utilization. Whenever necessary these materials are submitted to special scientific experts, by whom they are made the subjects of particular investigation or practical tests. Reports are also obtained from technical or trade-experts in regard to the probable commercial or industrial value of any such products, whilst full information is collected from official or other trustworthy sources regarding the probable extent and cost of available supplies. All materials requiring scientific or technical examination, or commercial valuation, should be submitted to the Institute for examination either by, or through the Foreign Office, the Colonial Office, the India Office, or the Board of Trade or through the Colonial or Indian Government Authorities. Requests for the examination of such materials may also be submitted by Public Commercial Bodies and Institutions of the respective Colonies and Dependencies, or by the Representatives of H.M. Government in foreign countries.

COMMERCIAL INTELLIGENCE DEPARTMENT.

The Office of this Department, in the West Corridor, First Floor, is open daily from 10 a.m. to 5 p.m. (on Saturdays till 1 p.m.), for the purpose of answering enquiries and supplying information relating to the Commerce (Export and Import) and Industries of India and the Colonies. Applications may be made personally or by letter. Special information may be obtained from the Curators in charge of the Indian and of certain Colonial Collections. Arrangements have been made for the translation for mercantile firms of Trade Circulars, Price-Lists, and Catalogues into any Foreign Language, including the conversion of weights, measures and coinages, etc., at cost price, and application for such may be addressed to this Department.

CITY BRANCH OF THE IMPERIAL INSTITUTE.

REMOVAL TO 49, EASTCHEAP, E.C.

The City Enquiry Office and Reading Room have been removed from 112, Cannon-street to larger premises at 49, EASTCHEAP, where a commodious apartment is also provided for the display, to merchants, manufacturers, etc., of raw and manufactured products received, from time to time, from the Colonies and from India, and for which it is desired to find openings in British markets. Curators and other members of the Imperial Institute staff will attend at the Office, at stated times and by special appointment, to deal with enquiries and to assist in establishing or facilitating business relations with mercantile houses, etc., in the Colonies and India. The City Branch is in constant communication, by telephone and messengers, with the Imperial Institute, South Kensington. (*For further information see page 244*).

THE NORTHBROOK SOCIETY.

The Northbrook Society is affiliated to the Imperial Institute, and has a special room allotted for the exclusive use of its members in the Institute buildings. Its primary objects are to watch over and promote the interests of natives of India, and to provide a system of guardianship or supervision over such as are sent to Europe for education. The Society is controlled by a committee consisting of an equal number of Governors of the Imperial Institute and members of the Society, presided over by the Earl of Northbrook. It possesses an excellent library. Indian members, who pay no subscription to the Society, have the especial advantage of becoming Fellows of the Institute at half the usual subscription payable by the ordinary Fellows. Applications for membership of the Society should be addressed to the Secretary of the Northbrook Society, Imperial Institute, London, S.W.

"REQUIREMENTS" REGISTRY.

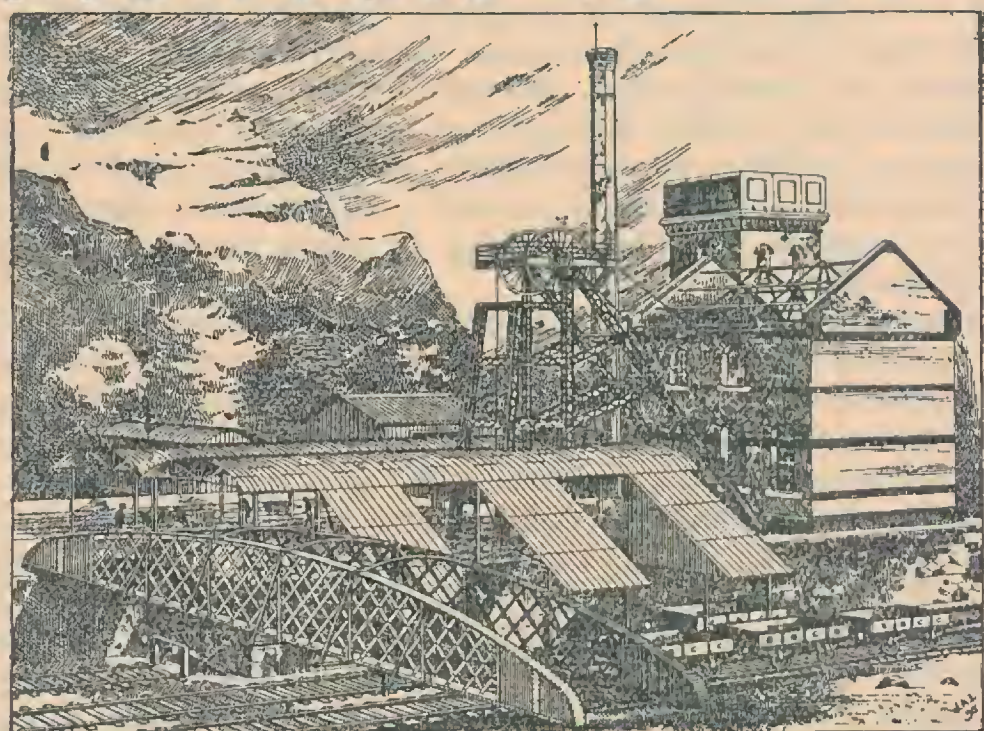
With the object of affording Fellows of the Imperial Institute, and the General Public resident in the United Kingdom, an opportunity of making known special "wants" or "needs" in the British Colonies, India, and Foreign Countries, space will be regularly devoted to *approved* notices in a column reserved for this purpose. Advertisers may have their replies addressed to them direct, *c/o the Imperial Institute, London, S.W.*, under a distinctive number and initials. The cost of postage will be charged for the transmission of replies delivered at the Institute. Residents in the Colonies and India, and Foreign Countries, can register in like manner. (*For further particulars see page 242*).

IMPERIAL INSTITUTE JOURNAL.

An ornamental red Cloth Cover, for binding the numbers of the JOURNAL for the year 1901 into one volume, may be obtained at the TICKET OFFICE of the INSTITUTE, or from Messrs. WATERLOW AND SONS LIMITED, Blomfield-house, London-wall, E.C., price 2s. 6d. An index and title-page to the volume were inserted in the January issue of the JOURNAL. Bound yearly volumes of the JOURNAL, for the years 1895-1901, may be had at 10s. each.

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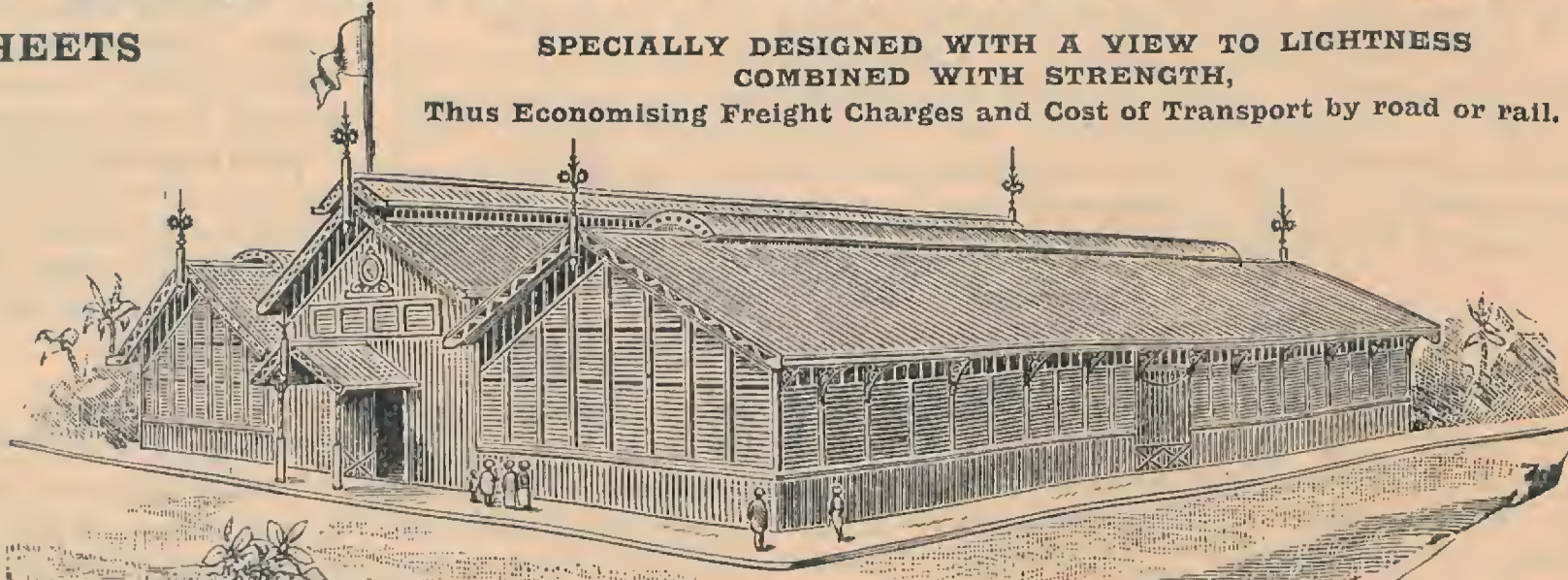
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IMPERIAL INSTITUTE (TRANSFER) ACT, 1902.

AN
ACT

To provide for placing the Imperial Institute under the management of the Board of Trade, and for other purposes.

[*Royal Assent, July 22nd, 1902.*]

WHEREAS by Royal Charter dated the twelfth day of May one thousand eight hundred and eighty-eight an association (hereinafter referred to as "the existing Corporation") was incorporated by the name of "The Imperial Institute of the United Kingdom, the Colonies, and India, and the Isles of the British Seas" for the purposes mentioned in the charter and set out in the First Schedule to this Act (hereinafter referred to as "the purposes of the Imperial Institute"):

And whereas the existing Corporation is governed under its charter (as amended by a supplemental charter dated the sixteenth day of August one thousand eight hundred and ninety-four) and under a constitution (made in pursuance of the charter and approved by Royal Warrant dated the twenty-first day of April one thousand eight hundred and ninety-one) which by virtue of the charter has the same validity and effect as if the provisions thereof had been contained in the charter:

And whereas the existing Corporation have in accordance with their charter established an Endowment Fund (in this Act referred to as "the Endowment Fund") consisting of securities representing a sum of one hundred and forty thousand pounds and that endowment fund is in accordance with the charter vested in trustees and the existing Corporation are entitled to the income of the fund but are not entitled to the capital thereof:

And whereas by the several leases described and numbered (1) (2) and (3) in the Second Schedule to this Act certain land at South Kensington was vested in the existing Corporation for the purpose of building the building known as the Imperial Institute for a term of nine hundred and ninety-nine years at the rents mentioned in the said Schedule:

And whereas by the transfer described and numbered (4) in the said Schedule the existing Corporation with the approval of His Majesty's Commissioners for the Exhibition of 1851 assigned their interest under the said leases to the Commissioners of Works and the Commissioners of Works by the sub-lease described and numbered (5) in the said Schedule demised to the existing Corporation free of rent for a term of nine hundred and eighty-seven years from the twenty-ninth day of September one thousand eight hundred and ninety-nine a part (described in the said sub-lease) of the land and building at South Kensington comprised and referred to in the said leases and the part so demised is in this Act referred to as "the Imperial Institute Building":

And whereas it has been arranged that the Imperial Institute building and all other property of the existing Corporation should be under the management of the Board of Trade and used by them so far as practicable for carrying out the purposes of the Imperial Institute and for such other similar purposes as the Board of Trade may determine having regard to the commercial and industrial interests of the Empire:

And whereas it is expedient for that purpose that the existing Corporation should be dissolved and that such provisions should be made as in this Act appear in connection with the transfer of the property of the Corporation and for the benefit of the life members of the Corporation and for dealing specially with certain obligations of the Corporation:

And whereas it is expedient that an advisory committee should be established for assisting the Board of Trade in carrying out their powers and duties under this Act:

And whereas the objects of this Act cannot be attained without the authority of Parliament:

MAY IT THEREFORE PLEASE YOUR MAJESTY

That it may be Enacted and BE IT ENACTED by the King's most Excellent Majesty by and with the advice and consent of the Lords Spiritual and Temporal and Commons in this present Parliament assembled and by the authority of the same as follows:—

1.—This Act may be cited as the Imperial Institute (Transfer) Act 1902.

2.—Subject to the provisions of this Act as to the Imperial Institute building and the Endowment Fund and other special matters all property real or personal of the existing Corporation and all rights or obligations of that Corporation and all debts or liabilities of that Corporation shall be transferred to and become the property rights obligations debts or liabilities of the Board of Trade.

3. (1) The Imperial Institute building and all property transferred to the Board of Trade under this Act shall be used and the income of the endowment fund and all sums received by the Board of Trade in respect of the exercise of any their powers or duties under this Act shall be applied by the Board of Trade so far as practicable for carrying out the purposes of the Imperial Institute and for such other similar purposes as the Board of Trade may determine having regard to the commercial industrial and educational interests of the Empire.

(2) The Board of Trade shall receive and hold any sums of money or other property given or entrusted to them for any purpose for which property transferred to them under this Act may be used and shall apply any such sums of money or property for the purpose for which they are so given or entrusted to them.

4.—(1) The Imperial Institute building and the Endowment Fund shall by virtue of this Act be transferred to and become vested in the Imperial Institute trustees appointed under this Act for the same estate and interest as that for which before the commencement of this Act they were vested in the existing Corporation or the endowment trustees appointed under the charter of that Corporation.

(2) The income of the Endowment Fund shall be paid over by the Imperial Institute trustees to the Board of Trade, and the Imperial Institute building shall be under the management of the Board of Trade.

5.—The Board of Trade shall after consulting the advisory committee make provision in the Imperial Institute building either by the setting apart of certain rooms or otherwise as seems desirable for giving to the life members of the existing Corporation privileges similar as far as practicable to those enjoyed by them under the charter of the existing Corporation.

6.—(1) Any obligation under any covenant on the part of the Imperial Institute with His Majesty's Commissioners for the Exhibition of 1851 to appoint a member of the Commission as one of the trustees of the Endowment Fund or to deal with the Endowment Fund according to the purposes and limitations laid down in the charter of the Imperial Institute shall cease.

(2) The transfer of the Imperial Institute building effected by this Act shall be deemed to have been made with the consent of the Commissioners of Works.

(3) The Board of Trade shall give effect to the agreement dated the twenty-fourth day of January one thousand eight hundred and ninety-three and made between the Imperial Institute and the Northbrook Society having reference to the use by the Society of the Imperial Institute building and other matters connected therewith but the Board and the Society shall respectively have power to determine that agreement on giving six months' notice to the other party and the determination of the agreement under that power shall have the same effect as the determination of the agreement under the powers contained for the purpose therein.

7.—The Board of Trade may take such steps make such arrangements and employ such persons as they think necessary or expedient for carrying out their duties under this Act.

8.—(1) There shall be established for the purposes of this Act an advisory committee consisting of the persons named as the first committee in the first column of the First Part of the Third Schedule to this Act and of their successors in office.

(2) The provisions of the Second Part of the Third Schedule to this Act shall apply with respect to the advisory committee.

(3) His Majesty may by Order in Council if it appears expedient to do so with a view of securing the proper representation of the commercial and industrial interests of the Empire vary the constitution of the advisory committee and any such Order in Council shall as from the date of its publication or any later date mentioned in the Order take effect as if it were enacted by Parliament.

9.—(1) The persons who are for the time being the First Commissioner of His Majesty's Treasury the Secretary of State for the Colonies the Secretary of State for India and the President of the Board of Trade shall be the Imperial Institute trustees for the purposes of this Act and shall be a body corporate by that name with perpetual succession and a common seal and with power to take purchase hold and dispose of lands and other property for the purposes of this Act.

(2) The Imperial Institute trustees may invest any money constituting the capital of the Endowment Fund in any securities in which trustees may for the time being invest under the Trustee Act 1893 and the Acts amending that Act.

(3) The Imperial Institute trustees may if required by the Board of Trade with the consent of the advisory committee sell or otherwise dispose of any real or personal estate held by them and apply any proceeds of sale for the purpose of carrying out the objects of this Act in any manner for which capital is properly applicable and not otherwise.

10.—(1) As from the commencement of this Act the existing Corporation shall be dissolved and the Imperial Institute charter dated the twelfth day of May one thousand eight hundred and eighty-eight and the constitution made thereunder and the supplemental charter dated the sixteenth day of August one thousand eight hundred and ninety-four are hereby revoked.

(2) The trustees of the Endowment Fund and the members of the governing body executive council and any committee of the existing Corporation are discharged from their duties under the charter and constitution and the transfer described and numbered (4) in the Second Schedule to this Act and any other act done by them in relation to the Institute are hereby confirmed.

11.—This Act shall except as expressly provided come into operation on the first day of January nineteen hundred and three or such other day not being six months later than that day as the Board of Trade may appoint and the Board of Trade may appoint different days for different purposes and different provisions of this Act.

12. Nothing in this Act contained affects any rights of the University of London in or to any part of the Imperial Institute building.

13.—(1) All costs charges and expenses of and incident to the preparing for obtaining and passing of this Act or otherwise in relation thereto shall be paid by the existing Corporation.

(2) This section shall come into operation upon the passing of this Act.

SCHEDULES.

FIRST SCHEDULE.

THE PURPOSES OF THE IMPERIAL INSTITUTE.

(*Extracted from the Royal Charter of the Imperial Institute.*)

1.—The formation and exhibition of collections representing the important raw materials and manufactured products of Our Empire, and of other countries so maintained as to illustrate the development of agricultural, commercial and industrial progress in Our Empire, and the comparative advances made in other countries.

2.—The establishment or promotion of commercial museums, sample rooms, and intelligence offices in London, and other parts of the Empire.

3.—The collection and dissemination of such information relating to trades and industries, to emigration, and to the other purposes of this Our Charter as may be of use to the subjects of Our Empire.

4.—The advancement of trades and handicrafts by exhibitions of special branches of industry and commerce, and of the work of artisans and of apprentices.

5.—The promotion of technical and commercial education, and of the industrial arts and sciences.

6.—The furtherance of systematic colonisation.

7.—The promotion of conferences and lectures in connection with the general work of the Institute, and the facilitating of commercial and friendly intercourse among the inhabitants of the different parts of the British Empire.

8.—The doing anything incidental or conducive to carrying into effect all or any of the foregoing purposes.

SECOND SCHEDULE.

(*Enumeration of Deeds referred to in the Act.*)

THIRD SCHEDULE.

PART I.

ADVISORY COMMITTEE.

FIRST COMMITTEE.	Mode in which any Vacancy in the Office is to be filled up.
Sir Francis J. S. Hopwood, K.C.B., C.M.G.	Appointment by the Board of Trade.
Sir Alfred E. Bateman, K.C.M.G.	
The Right Honourable Lord Avebury, F.R.S., D.C.L.	
The Right Honourable Sir Henry H. Fowler, G.C.S.I., M.P.	
The Right Honourable W. L. Jackson, M.P.	
Sir William H. Houldsworth, Bart., M.P.	Appointment by the Secretary of State for the Colonies.
Sir Cecil Clementi-Smith, G.C.M.G.	
Sir Stuart Bayley, K.C.S.I.	Appointment by the Secretary of State for India.
T. W. Holderness, Esq., C.S.I.	
Thomas Henry Elliott, Esq., C.B.	Appointment by the Board of Agriculture.
General Sir Owen Tudor Burne, G.C.I.E., K.C.S.I.	Appointment by the Government of India.

FIRST COMMITTEE.	Mode in which any Vacancy in the Office is to be filled up.
The Lord Strathcona and Mount Royal, G.C.M.G.	Appointment by the Government of the Dominion of Canada.
The Honourable Henry Copeland	Appointment by the Federal Government of the Commonwealth of Australia.
The Honourable William Pember Reeves	Appointment by the Government of New Zealand.
Sir Walter Peace, K.C.M.G.	Appointment by the Governments of Cape Colony and Natal alternately, the Government of Cape Colony being entitled to the first appointment.
The Honourable Sir Robert G. W. Herbert, G.C.B., G.C.M.G.	Appointment in manner directed by the Secretary of State for the Colonies.
* The Right Honourable the Lord James of Hereford.	Vacancies not to be filled up.
* Sir Frederick A. Abel, Bart., G.C.V.O., K.C.B.	

* Representing the existing Corporation

PART II.

- 1.—The term of office of a member of the Advisory Committee shall be three years, except in the case of members of the first committee.
- 2.—The term of office of members of the first committee shall expire on the thirty-first day of December nineteen hundred and three, but the Board of Trade may, if they think it expedient, extend the term of office of the members representing the existing Corporation up to the thirty-first day of December nineteen hundred and six.
- 3.—The members of the Advisory Committee shall retire on the expiration of their term of office, and their offices shall be filled by fresh appointments, made in the manner directed by the second column of the First Part of this Schedule.
- 4.—A casual vacancy occurring in the office of any member of the committee by death, resignation, or otherwise, shall be filled by appointment in the manner directed by the second column of the First Part of this Schedule as respects the member whose office is vacant, but the member so appointed shall hold office only so long as the member whose office is vacant would have held office.
- 5.—A vacancy in the office of either of the members of the first committee representing the existing Corporation shall not be filled.
- 6.—A retiring member may be re-appointed.
- 7.—The Advisory Committee may act notwithstanding any vacancy in their number.

FINANCIAL AND COMMERCIAL RETROSPECT.

UNITED KINGDOM.—The returns of our foreign trade for July last compare very well with those for the same month of last year, and, although the number of working days was the same in both cases, there was a considerable rise in the value of both the imports and the exports. The former were valued at £44,086,960, and thus showed an increase of £1,058,138, or 2·4 per cent. In them increases were recorded in all classes of articles except metals, dutiable articles of food and drink, living animals for food, and raw materials for textiles. The fall in raw cotton was somewhat heavy, amounting to 54·0 per cent. in quantity, and 49·9 per cent. in value; it was due mainly to decreased shipments from the United States, which sent only 112,499 cwt., against 500,570 cwt. in July of last year. In cotton manufactures there was a rise in value of 16·3 per cent. Flax showed the large increase of 79·9 per cent. in amount and 88·2 per cent. in value, and in jute also there was an advance, though on a much smaller scale, but in hemp there was a decrease of 45·0 per cent. in amount and 41·7 per cent. in value. Sheeps' wool, though it lost 7·2 per cent. (3,507,222 lb.) in quantity, rose 3·4 per cent. (£50,382) in value. In cereals, wheat was the only item that advanced, its quantity improving by 20·5 per cent. and its value by 25·3 per cent., chiefly owing to larger shipments from India. But wheat-flour fell off by 12·9 and 8·0 per cent. in quantity and value respectively; barley by 29·2 and 26·3 per cent.; oats by 48·9 and 36·1 per cent., and Indian corn by 27·4 and 20·8 per cent. Rice was better by 62·1 per cent. in quantity, but only by 24·0 per cent. in value. Living animals for food showed a decrease owing to smaller arrivals from the United States, and so did fresh beef and bacon, but fresh mutton was somewhat better, and preserved meat (not salted) rose 19·5 per cent. in amount and 39·4 per cent. in value. Of butter, which was greater by 11 per cent. in quantity and worth 13·3 per cent. more, the total value was £2,198,392, a figure which is a disgrace to the British farmer and an unequivocal testimony to his invincible supineness and crass stupidity. Refined sugar was all but stationary in quantity, but fell off 18·3 per cent. in value; the raw article, however, increased 63·5 per cent. in the former respect, and 38·5 per cent. in the latter. In tea, too, there was a substantial improvement of 40·1 per cent. in amount and 33·4 per cent. in value, and unmanufactured tobacco went up 46·6 per cent. in quantity and 42·0 per cent. in value. Wood, the largest single item on the import list, rose in value from £3,652,308 to £3,859,691, or 5·6 per cent., with an

increase in quantity of 4·1 per cent. The exports of British and Irish produce were valued at £26,029,170, and thus showed an increase of £1,643,399, or 6·7 per cent., which was spread over every class of article except raw materials and yarns and textile fabrics. Among the former, coal fell off by 11·6 per cent. in value, although its quantity was slightly larger. Cotton piece-goods fell from £5,066,265 to £4,678,859, owing to a diminution of 8·1 per cent. in the amount exported; India, the foreign West Indies, Venezuela, and Argentina took less, but Japan, British South Africa, and Australia more. Cotton yarn and twist also suffered a reduction of 23·8 per cent. in quantity, and 20·5 per cent. (£148,209), owing to a smaller demand from Holland, Turkey, China, and India. Other cotton manufactures were worth 7·3 per cent. more. Jute yarn and piece-goods were less, but linen yarn and piece-goods considerably better. Sheep and lambs' wool improved by 64 per cent. in quantity and 76·1 per cent. in value, and woollen and worsted yarns rose by 16 per cent. in the former respect and 15·5 in the latter. Woollen tissues also were better by 12·5 per cent. in quantity and 10·6 per cent. in value, as also were worsted tissues, though to a smaller extent. In iron and steel there was an important increase of 87,485 tons, meaning £452,923 in money, and machinery and millwork was worth £328,549 more (20·9 per cent.). New ships for foreigners showed only the trifling increase of £6,032, but the exports of telegraphic wire and apparatus were better by £844,461. All chemicals, except bleaching powder, improved in value, chemical manures rising 5·7 per cent. in amount and 13·8 per cent. in value, while soda compounds increased 8·9 per cent. in quantity and were worth 12·1 per cent. more. The re-exports of foreign and colonial merchandise advanced by half-a-million sterling, their value being £6,034,529, as against £5,526,083 in July of last year.

The results achieved by the leading English railways, during the last half-year, show some slight improvement on those achieved in the same period of 1901. For the twelve principal lines, the gross receipts, amounting to £37,606,000, showed an increase of £769,000, or 2·1 per cent., while the expenditure at £24,243,000 was 1 per cent. (£233,000) smaller. The net revenue at £13,363,000 was better by 8·1 per cent., or £1,002,000. The working expenses were reduced from 66·5 per cent. of the gross receipts to 64·5 per cent. As a result the dividends declared were higher than in 1901 in every case except that of the North Eastern, which made no change, although the increases were mostly not very great. The following table shows the rates of dividends paid in the first halves of 1901 and 1902, the amounts thus absorbed, and the amounts carried forward:—

Companies.	Dividends.				Forward.	
	Per cent.		Amount.			
	1902.	1901.	1902.	1901.	1902.	1901.
			£	£	£	£
Great Central ...	—	—	—	—	30,342	1,250
Great Eastern ...	1½	1¼	103,972	82,893	11,844	9,418
Great Northern...	2½	2¼	210,788	189,709	8,232	6,692
Great Western ...	3½	2¾	519,537	317,954	23,948	19,730
Lanc. & Yorks. ...	3¼	3	290,470	251,115	21,891	21,505
L. Brighton & S.C.	3	2½	140,961	122,864	20,268	8,325
L. Chat. & Dover ...*	2½	£1. 9s.	84,092	48,620	299	13
Lon. & N.-Western	4¼	4½	1,018,203	964,602	54,672	32,918
Lon. & S.-Western	4	3½	242,190	211,479	25,104	18,376
Midland ...	4½	4	849,590	746,136	21,270	11,046
North-Eastern ...	4½	4½	676,616	652,938	48,060	35,914
South-Eastern ...	—	—	—	—	19,566	—
Total ...	—	—	4,136,419	3,588,310	285,496	165,187

* Four-and-a-Half per Cent. Arbitration Preference.

COLONIES.—The financial statements delivered in several States of the Australian Commonwealth during the past month were far from cheerful. In South Australia, the State Treasurer had to announce a total deficit of £239,000. The actual revenue for the year was £2,428,000 and the expenditure £2,650,000; the extraordinary expenditure amounted to over £50,000, and the revenue from the railways £115,000 less than was estimated. For the current financial year the revenue is estimated at £2,463,000 and the expenditure at £2,461,000. New taxation of incomes and new stamp duties are expected to yield £89,000, while economies in the railway working and in the public services are estimated to save a further £50,000. In Victoria again the financial outlook is bad, and it is feared that the revenue will not reach the level expected and that the deficit for the present year may reach £650,000. In Tasmania it was declared that the Treasurer's difficulty was the adjustment of the State's finances to a greatly reduced revenue, although the country was stated to be generally in a prosperous condition. The deficit at the end of 1901 was £97,000, which might be increased during the current year to £219,000, subject, however, to new taxation proposals, designed to make up for the loss of about £160,000 annually in the Customs revenue under the Federal Tariff, as compared with what was obtained under the State Tariff in 1900. The Treasurer proposes to effect economies in expenditure to the amount of £33,000, and hopes to get an additional sum of about £76,000 from a graduated land tax on properties over £10,000, from stamp duties on receipts, from succession duties on real estate, and from income-tax assessed on house-rent values. In the first half of the present year the total value of the imports into the Transvaal was £4,217,698, as compared with £143,192 in the corresponding period of last

year. The imports arriving *via* Natal accounted for £1,825,420, those *via* the Cape for £2,017,989, and those *via* Delagoa Bay to £374,289. The gold yield of the Witwatersrand mines which have restarted working amounted in July to 149,179 oz. of fine gold; in June the amount was 142,780 oz. In Rhodesia the output showed little change, though at 15,226 oz. it was less both than in July of last year (15,651 oz.) and in June last (15,841 oz.). The yield in Victoria was 97,183 oz. in July, showing the large increase of 21,492 oz. over the yield for the same month of 1901. In New South Wales, the yield was 34,136 oz. as against 33,018 oz. in the preceding July. In West Australia 174,494 oz. of gold were obtained from 167,617 tons of ore: in July of last year, 138,620 tons of ore yielded 161,235 oz. of gold. New Zealand produced 47,051 oz., against 31,365 oz. in the same month of last year. In British Columbia, according to a report just issued, the mineral production for 1901 reached the value of £4,017,400, against £3,268,000 in 1900, and £2,478,600 in 1899. Though in 1901 the gold-placer yield fell off by over £60,000, the lode output increased from £690,676 to £869,721. Silver was better by £115,000 and copper by £566,000, but lead was reduced in value to the extent of £138,000. The output of coal amounted to 1,691,537 tons, the largest recorded, and its value, together with that of the coke for which part of it was used, exceeded that of the previous year by £54,000.

The following table shows the variations which have occurred in the securities of certain Colonial Governments during the last three months:—

	30th June.	29th July.	28th Aug.
Canada 3 per cent. . . .	102-102½	102½-103½	102½-103
Cape 3 per cent. . . .	97¼-97¾	94¼-94¾	94¼-94¾
Natal 3 per cent. . . .	97-97½	95½-97	96½-97½
New S. Wales 3 per cent. . .	95¼-95¾	94¼-94¾	94¼-94¾
New Zealand 3 per cent. . .	96-96½	96-96½	96¼-96¾
Queensland, 3 per cent. . .	94½-95	93½-94	93¼-93¾
South Australia 3 per cent. .	95¼-95¾	94¼-94¾	93¾-94¼
Tasmania 3½ per cent. . .	103½-104½	103½-104	103½-104½
Victoria 3 per cent. . . .	97¼-97¾	94¾-95¼	94¼-95
West. Australia 3 per cent. (May-Nov.)	94¾-95¼	94-95	93½-94½

INDIA.—The subjoined table shows the fluctuations which have occurred in the prices of certain Indian railways during the last three months:—

	30th June.	30th July.	29th Aug.
Bengal and North Western . .	129-133	128-132	128-132
Bengal-Nagpur Gua. 4 per cent. .	105-109	105-109	102-106
Bombay, Baroda & Cent. India .	158-162	154-158	150-155
Indian Midland 4 per cent. . .	104-108*	105-109	103-107
Madras Grntd. 5 per cent. . .	137-141	134-139	133-137
South Indian 4½ per cent. Deb. .	137-141	137-141	137-141
Southern Mahratta 3½ per cent. .	105-108*	104-107	103-106

* Ex. div.

FOREIGN COUNTRIES.—In the first half of this year the imports into Argentina amounted to \$51,243,230 gold, against \$56,619,775 gold in the same period of 1901. The exports were \$105,203,721 gold, against \$97,776,764 gold in 1901. Ten years ago the imports were about \$20,000,000 less, and the exports about \$30,000,000 less, so that it would appear that Argentina's troubles spring not so much from lack of development of material resources, as from bad government.

The United States in the first six months of this year produced no less than 8,808,574 gross tons of pig iron; in the first half of last year the amount was 7,674,613 tons, and in the second half 8,203,741 tons. The American production for the first six months of this year is, therefore, already well ahead of either that of Great Britain or Germany for the whole of last year, when the production in the former country was 7,761,830 gross tons, and in the latter 7,736,663 tons. In Germany the exports of iron seem growing rapidly. In the first half of this year they amounted to 1,503,742 tons, whereas in the same period of 1901 they were 994,404 tons, and only 744,224 tons in 1900. On the other hand the imports are falling off; amounting to 502,150 tons in the first six months of 1900, they were only 233,690 tons last year, and 132,610 tons this year. Germany's net exports of iron this year were, therefore, 1,371,132 tons; two years ago they were only 242,074 tons. Of these exports nearly one-fourth appear to have come to Great Britain, but the United States took 75,758 tons, against only 3,947 tons in 1901, including 22,906 tons of rails against 41 tons. The quantities sent to Austria and Russia, however, declined.

Our usual table of exchanges follows:—

	28th June.	29th July.	28th Aug.
Paris, cheques	25f. 17c.	25f. 16c.	25f. 18c.
Berlin, sight	20m. 46½pf.	20m. 48pf.	20m. 48½pf.
Vienna, sight	24kr. 1h.	23kr. 96½h.	23kr. 96½h.
Amsterdam, sight . . .	12fl. 14¼	12fl. 12½	12fl. 12½
Madrid, sight	34ps. 40	34ps. 40	34ps. 46
Lisbon, sight	42½d.	41½d.	41½d.
St. Petersburg, 3 months .	94r. 10	94r. 10	94r. 15
Bombay, T.T. . . .	rs. 3½d.	rs. 3½d.	rs. 3½d.
Calcutta, T.T. . . .	rs. 3½d.	rs. 3½d.	rs. 3½d.
Hong Kong, T.T. . . .	rs. 8½d.	rs. 8½d.	rs. 8½d.
Shanghai, T.T. . . .	2s. 3½d.	2s. 3½d.	2s. 4d.

AGRICULTURAL RETROSPECT.

UNITED KINGDOM.—Harvest work proceeded slowly during August, the cutting of the crops being interrupted by frequent and heavy falls of rain. Rye, winter oats, and winter barley were the only crops harvested by the second week. Wheat cutting was in progress generally by August 11, though in the earlier localities a start had been made a week previously. Frequent drenching rains in many parts rendered all corn unfit to be touched for some time after they ceased, so that farmers have experienced many vexatious delays. Pastures continue in good growing condition and the grazing outlook is reassuring. Root and other forage crops are looking well, and there is such a wealth of leaf upon the mangel, that nothing but bright sunshine is needed for the crop to develop into perhaps the largest ever grown. The *Agricultural Gazette* summarizes the harvest reports which it has been publishing for the last four or five weeks from all parts of the country. For the several corn crops the majority of the verdicts are either "over average" or "average." Wheat is not so commonly put over average as barley or oats, and of the two latter one is deemed the better crop in some districts and the other elsewhere. Before the recent storms came barley appeared to be the corn crop of the season; but a great many reports now state that it is badly laid. Other cereals are laid also in some districts, but not generally so badly as barley. Accounts are about as favourable for beans and peas as for the white-straw crops, except for the mention of aphid attack in many cases, in spite of which they appear to be well up to average or above it in the great majority of districts. Hay is the crop of the season in England and Wales. Only two or three reports put the yield under average, while the great majority describe it as more or less over the standard, many saying 20 per cent. over, and others speaking of it as a bumper crop, the best for years, or in otherwise flattering terms. The greater part of it appears to have been well saved; but there are many complaints of damage from rain. Just as there is no doubt as to hay being the best crop of the season, so there need be no hesitation in declaring potatoes to be the least satisfactory. Estimates of this crop are more conflicting than those of any others, and there are more under-average verdicts, while references to the prevalence of disease are numerous.

COLONIES.—Twenty thousand men and boys have arrived in MANITOBA to assist in the harvesting of the magnificent crops. The yield of wheat is expected to be 60,000,000 bushels, and a return of over 40,000,000 bushels of other grain is estimated. From ONTARIO it is reported that there will be a good crop of apples in that province, as well as a plentiful yield of peaches, pears and plums. The grain crop of the province this year promises to be a full one. The latest telegrams from NEW SOUTH WALES report that rain has set in over the north, the north-west, and portions of the western pastoral country. There has also been light rainfall in portions of QUEENSLAND.

An important Blue Book (Cd. 1,163) was issued at the end of July by the Colonial Office, dealing with the whole subject of the re-settlement of South Africa. Incorporated in the volume is a highly interesting and informing report on irrigation in South Africa by Mr. Willcocks, the well-known Nile expert, a *resumé* of which appeared in the IMPERIAL INSTITUTE JOURNAL for March last (p. 66, Agricultural Retrospect). Perhaps the most important despatch in the volume is that of Lord Milner dealing with the introduction of new settlers. On January 20, 1902, he writes:—"As a consequence of the war the agricultural population will be even more inadequate than it formerly was, and in order to do anything like justice to the land a new and progressive farming population is required to reinforce the old. It is also most essential, from the social and political point of view, that the old condition of things should not be reproduced, in which the race division coincided almost completely with a division of interests, the whole country population being virtually Boer, while the bulk of the industrial and commercial population was British. But the introduction of British settlers, under which term I include colonists from Australia, New Zealand, and Canada, and from Cape Colony and Natal, as well as from the Mother-country, is beset with very exceptional difficulties. There is not, I think, any lack of suitable settlers. The number of those who are anxious to come is, as far as I can judge, quite as large as we can possibly provide for." Returning to the same subject on January 25, he deals with it at great length. The following are a few extracts from the despatch: Land settlement must be undertaken on a large scale; otherwise, however useful, it will be politically unimportant. Moreover, it is essential that, as Mr. Arnold Forster's Commission insisted, only the best quality of land should be secured for the settlement, at any rate in the first stages of the movement, and that the conditions should be such as to attract the best quality of settler. At the same time the scheme must be in its details sufficiently elastic to meet the requirements of different classes, men of some capital, as well as men who bring with them little more than experience and character, and to vary with the varying character of the farms. Take only the broad distinction between dry and irrigated farms, familiar to every South African. Evidently a much larger area is required in the former than in the latter, while the experience needed by the farmer would vary greatly in the two cases. In the former he would be mainly employed in stock-rearing, while in the latter the cultivation of cereals, and, in favourable neighbourhoods, market-gardening, would be the most profitable industry. Australian ranchers seem peculiarly suited to the high veldt, while the corn lands of the conquered territory could have no better occupants than young progressive farmers from the Scottish lowlands. And there are intermediate types of farms suited to settlers

of the most varied experience and resources. Seeing the number of men now actually in the country—over-sea Colonists, South African Colonists, Yeomen from home—who either have applied or are only waiting for some definite announcement, and having regard to the immense correspondence with which I have been favoured from home and the colonies, showing that many others are ready to come, I make no doubt whatever that we could get 10,000 or more agricultural settlers within a twelvemonth if we were able to provide for them. Our great difficulty is not to get the men, but to get the land of suitable quality on which to plant them." After pleading for a Government power of expropriation in order to get the necessary land, Lord Milner continues:—"We are at best in a position to provide for three or four hundred settlers. To make any real impression we require at least as many thousands. I do not, indeed, think that if the movement for the introduction of British settlers were once effectively started, it would stop at three or four thousand, nor do I believe that it would be confined to the lands acquired by Government. If once a nucleus of British settlers is established in any districts, private individuals, whether severally or in associations, will gather round it, for the number of people who are waking up to the possibilities of South African farming, under a progressive Government, is already considerable. But I am confident that Government action on a large scale is necessary to start the movement. The time is fast approaching when it will be absolutely necessary to raise loans for both new Colonies to meet expenses arising immediately out of the war. I wish to place on record my profound conviction that, unless in raising these loans we provide a substantial sum for the purchase of land and the settlement thereon of farmers of British races, an opportunity will be lost which will never recur, and the neglect of which will have the most prejudicial effect on the future peace and prosperity of South Africa. I do not, indeed, ask that these first loans include a sum as large as may ultimately be required if land settlement is to assume the proportions which I contemplate. But, if our first considerable undertakings in this line are proving themselves successful, I foresee no difficulty in obtaining more money later on, should we require it. What I do fear is a check now, when we ought to be in a position to seize every possible opportunity of getting hold of land suitable to our purpose, and of retaining in the country such men as we want to put on it. If we lose the next year or two, we lose the game, and without that power of acting promptly, which a ready command of money alone can give, we shall begin to throw away opportunities from this moment at which I am writing onwards. What I want to put plainly to His Majesty's Government are these two questions: (1) Are we to be allowed to go on purchasing good land, by voluntary agreement wherever possible, but compulsorily if necessary? And, assuming this question to be answered in the affirmative, (2) what amount shall we be able to dispose of for this purpose in the immediate future? In order to facilitate a decision on the latter point, it would be best to put forward a definite proposal. And the proposal which I venture to make is, that we should ear-mark a sum of two millions in the case of the Transvaal, and one million in the case of the Orange River Colony, out of the first loans raised by either Colony, for the purpose of land purchase and settlement."

INDIA.—Though the monsoon is deficient this season over a large part of India, the latest telegrams state that rain has fallen in those areas in which it was most needed. In Western India the rain just saved the crops, which were in imminent danger, and has removed the immediate fear of famine. The Central Provinces and Berar have also benefited by the rains. Reports from the tea districts in Assam record the yield normal, and the prospects fair, except in Darjiling, where the weather has been unfavourable and the yield poor.

Mr. J. Ferguson, of *The Ceylon Observer and Tropical Agriculturist*, has communicated to *The Times* the following statistics of the planting enterprise of CEYLON for the present year. The total approximate areas under the principal products are as follows:—tea, 382,343 acres; cacao, 24,136 acres; cardamoms, 8,621 acres; coffee (Arabian), 4,304 acres; coffee (Liberian), 758 acres; cinchona, 3,471 acres; rubber (chiefly young plants, and interspersed with other products), 3,356 acres; grass (cultivated), 4,461 acres; camphor, annatto, cocoa, kola, ramie, vanilla, pepper, cloves, citronella grass, divi-divi, croton, castor oil, aloes, cinnamon, tobacco, cotton, 11,201 acres; cocoa-nuts, arecas, nutmegs, fruit trees (on the cacao, tea, or coffee plantations), 22,696 acres; fuel timber, sapan, and kapok (on the tea, cacao, or coffee plantations), 7,576 acres. The most notable fact revealed by the above figures is the falling off in the area of tea, the total in cultivation on plantations being 4,000 acres less than a year ago, or, including native gardens, a decrease of 6,000 acres, making a total of 386,000 in place of 392,000 acres. This must be due to the abandonment of non-paying fields and some unprofitable gardens; for it is accompanied by an extension of the total extent in cultivation by 1,000 acres, although poor coffee has gone down, being 3,200 acres less than a year ago. Cacao, on the other hand, is 500 acres more in planted extent; cardamoms are greater in area by 1,800 acres; cinchona shows an increase of 1,000 acres; and indiarubber (chiefly the Para or Hevea variety) of nearly 1,000 acres—which must, however, be rather under the actual area planted during the year, the total extent planted being about 3,400 acres. In several minor products too—camphor, nutmeg, crotons—there has been a good deal of planting, and still more has there been in the Kelani Valley and other low country estates, a planting out of cocoa-nut palms among the tea, just as Para rubber has been put in freely on the Kalutara tea estates. The check to tea, and the fact that there are no clearings this year to plant, ought to strengthen the hopes of those who believe in a future for this staple product, so soon as consumption overtakes production. The shipments of tea from Ceylon for the first six months of this year were 5,000,000 lb. behind those for the same period last year for the United Kingdom; but shipments to Russia and America show an increase. The cocoa-nut palm industry—chiefly in native hands—covering 600,000 acres with a crop of 1,000,000,000 cocoa-nuts (for oil, copra, fibre, desiccating kernels, etc.) is in a highly prosperous condition; while that in cinnamon bark continues fairly satisfactory.

FOREIGN COUNTRIES.—In reply to a question as to the continuance of the restrictions on the importation of cattle into this country from ARGENTINA,

the President of the Board of Agriculture stated in the House of Commons that the removal of such restrictions must mainly depend on the action of the Argentine Government against the introduction of disease into their country. This is an attitude which will meet with general approval. It is difficult, however, says *The Times*, to see what Mr. Hanbury meant when he added that the imports of dead meat into this country had largely increased. The official returns show that over the first six months of the present year the imports of dead meats of all kinds into the United Kingdom reached a total of 8,803,476 cwt., as against 9,369,491 cwt. in the first half of 1901, and 8,874,011 cwt. in the same period of 1900. As a matter of fact, therefore, our imports of dead meat have so far been less this year than in the corresponding periods of the two immediately preceding years. Moreover, if we look at the chief items in our meat import, we find that the totals for the first half of the present year are below the corresponding ones for the first six months of 1901. Thus of fresh beef we have imported 1,937,472 cwt. this year, as against 2,200,254 cwt. last year; of fresh mutton, 1,940,838 cwt. as against 1,988,727 cwt.; of fresh pork, 356,172 cwt. as against 409,901 cwt.; of bacon, 2,632,640 cwt. as against 2,839,526 cwt.; of hams, 768,070 cwt. as against 893,157 cwt. It would appear, therefore, that our imports of dead meat, far from having largely increased, have undergone a decisive decrease.

LABOUR RETROSPECT.

UNITED KINGDOM.—The state of employment in important industries during August compares unfavourably both with the preceding month and also with August of last year, this decline being only partly attributable to the extra holidays arising from the Coronation. The iron and steel trades, as well as the shipbuilding industry, seem to have settled down to a period of quietude. The textile industry shows practically no change. In the coal trade the situation continues to cause anxiety. In Lancashire and district the production, although materially reduced, still exceeds the consumption, with the result that further collieries are being shut down. In the South Wales industry grave uncertainty exists regarding the recently terminated sliding scale agreement. The glass trade dispute in the Stourbridge district continues, the union having made a further move. They have withdrawn their men from glass manufactories where the unionists were locked out. Meanwhile, the chances of the English glass makers competing successfully with their German rivals are becoming more remote.

This year the Trade Unions Congress will be held in London. Amongst the more important resolutions to be submitted to the delegates are nine bearing upon amendments of the Workmen's Compensation Act, consisting mainly of proposals to extend the Act to all trades and employment (by the miners' federation); to extend to injuries sustained by workmen "outside their actual employers' works" (by the boiler makers and iron and steel shipbuilders); and to abolish the 14 days' qualifying period. Three resolutions relate to amendments of the Factory Acts, so as to secure a Saturday's noon-day stop, and the appointment of inspectors to enforce the provisions of the Act with regard to ships. There are four notices of motion relating to postal questions, and six bearing upon the subject of wages—the Admiralty and fair wages, wages in the building trades, the minimum wage for Government labourers, wage stoppages, the minimum wage and the fair wages resolution—and there are three notices recommending the adoption of systems of compulsory arbitration.

COLONIES.—It is satisfactory to note that the Native Labour Association, to which has been entrusted the task of supplying natives for the mines and other industries on the Rand, is making steady progress. The returns for July showed an increase over those of previous months. Agents have proceeded to the northern limits of Mozambique, and to British Central Africa, and, as soon as an arrangement has been arrived at between the associations and the Governments concerned, recruiting will begin in these new districts on organised lines, and a steady supply of natives is anticipated. *The Times* publishes the following figures, which, with the exception of the Portuguese estimates, are based on the latest reports of the native Commissioners or Secretaries for native affairs in the different colonies and districts. The Portuguese figures have been supplied by the Curator of Portuguese native affairs, who explained that a census is now being taken, and that the present figures are an estimate only. The statistics are as follows:—Cape Colony, 1,059,141; Basutoland, 252,571; Natal and Zululand, 786,912; Orange River Colony, 129,787; Transvaal, 750,000; British Bechuanaland, 122,000; Rhodesia, 321,600; Swaziland, 45,000; Portuguese territory, 1,500,000; a total of a little under 5,000,000. Up to the present, the general estimate of the number of natives to the south of the Zambesi has been between seven and eight millions, and various great employers of labour, relying on this estimate—and using the most fallacious method of estimating the percentage of natives obtainable for labour—namely, one in five, have been convinced that the lack of labour is due to every cause except the true one—utter inadequacy of the native population to meet the labour demand. According to European statistics, the percentage of able-bodied males to the total population varies from 1 in 10 to 1 in 16. If the more liberal figures 1 in 8, be taken, a total of 622,000 natives is arrived at who are fit to work throughout South Africa. At the present time the farms in the Transvaal and Orange River Colony require 100,000 boys, the docks and ports 150,000, the needs of the mines on the Rand within two years will be 200,000, and of Kimberley 10,000. The house boys on the Rand to-day number 27,000.

Supposing all such requirements are met, there remain 135,000 natives for farms in the Cape, Bechuanaland, Natal and Rhodesia, the mining industries outside the Rand, the railways, railway construction, the Government service, irrigation, house and municipal work, a totally inadequate number, based even as it is on this liberal estimate. One of the highest authorities on South African natives states that this estimate is altogether too high. The true proportion should be 1 in 8 of 60 per cent. of the population, since it is necessary to allow at least 40 per cent. for able-bodied adults remaining in kraals to look after the women and children, and for those who are unwilling to work from various causes. Possessing such figures, naturally many mining houses on the Rand have become convinced that there is not enough native labour in South Africa to work the mines.

The report of the Chief Inspector of Factories, Workrooms, and Shops of VICTORIA for 1901, states that during that year the number of workers employed in the registered factories and workrooms of the State increased from 52,898 to 56,945. With respect to special Boards appointed under the laws of the State to determine the lowest rate of wages which may be paid in particular trades, there are now 38 such Boards in existence, six of which were authorised in 1896, 21 in 1900, 11 in 1901. The Boards authorised last year are to deal with the minimum wages payable to workpeople engaged in the following trades:—Aerated Water, Artificial Manure, Bedstead-making, Brass-working, Brewing, Brush-making, Iron-moulding, Leather Goods Manufacture, Malting, Oven-making, and Wicker Goods Manufacture. The Chief Inspector estimates that "when all the Boards have made their determinations, about 35,000 persons will receive the benefits of the system." With respect, however, to the Furniture trade, the report states that it is agreed by every one acquainted with the trade that the Chinese do not pay the wages required by the law, and the Chief Inspector remarks, "I have again to admit that I do not know of any means of compelling them to comply with the law." Refuting the allegation that the minimum wage is nearly always the maximum wage, and that fixing the former tends to take away from the good workman the incentive to do his best, the Chief Inspector states:—"the Special Board system has now been in force in a few trades since 1897, and I have no hesitation in saying that the minimum wage is never the maximum wage. If we take the clothing trade, for instance, the minimum wage for adult males is 45s. per week, whereas the average wage paid last year was 53s. 6d. per week; for adult females in this trade the minimum wage is 20s. per week, whereas the average wage paid last year was 22s. 3d. per week. In the boot trade the minimum wage is 42s. for adult males, whereas the average wage paid last year was 44s. 7d.; for adult females the minimum is fixed at 20s., whereas the average wage paid last year was 21s. 8d. Taking a trade in which the women are principally employed, namely, the shirt trade, the minimum wage is 16s. per week, whereas the average wage paid last year was 20s. 8d. In this case, however, the majority of the workers are engaged upon piece-work.

According to the Chief Secretary, MALTA has entered upon a period of prosperity, especially for the working classes, who form the bulk of this community. Owing to important works undertaken by the Local Government for the extension of the drainage, and for the increase of the water supply—by the military authorities in connection with the scheme of defence, such as the opening of new roads and the erection of additional barrack accommodation and by the naval authorities for the construction of two large docks in the French Creek—the demand for labour was in excess of the supply, hence wages rose. Compared with five years ago, an ordinary labourer can, at present, earn from 1s. 8d. to 2s. 6d., against 1s. 6d. to 2s. 2d. in 1897, and skilled labour commands from 3s. to 4s. 6d. per day, against 3s. to 3s. 4d., whilst fitters' wages range between 4s. and 5s. 6d., against 3s. 6d. to 5s. in 1897. This increase in the value of labour has caused a change in the economic conditions of the thrifty workmen of Malta, whose life is evidently easy and contented. The effect of this prosperity is noticed not only in the statistics of the savings bank, in which the yearly deposits have risen from £99,113 in 1897 to £120,109 in 1901, but also in the increase of marriages, in the large excess of births over deaths, and in the visible signs of comfort and cheerfulness observed in this class of population. The total expenditure incurred by the Government of Malta in public works in the year under review amounted to £101,849, of which £53,328 was for annually recurrent works, and £48,521 for works of an extraordinary nature. Sir Gerald Strickland states that an opinion is gaining ground that the climate of Malta has somewhat changed for the better, that the hot weather begins later and ends earlier, and that rain falls at periods of the year which used to be drier. This may be due to the Government having adopted the policy of systematically planting a number of trees every year. The standard of comfort of the people is being rapidly raised, owing to the greater contact with British subjects from other parts of the Empire, promoted by the great increase of the fleet and garrison. The presence of the garrison regiments with grown-up families, and the opportunities now enjoyed by non-commissioned officers, petty officers, and even by stokers in the navy, to bring their families out to Malta, are producing social conditions under which Malta is ceasing to be merely a dependency, and becoming a colony in a more proper sense of the word.

FOREIGN COUNTRIES.—Ever since the great Antwerp dock strike in the winter of 1900–1901, there has been a combined and successful effort on the part of employers to combat labour unions by the formation of a "federation" which has for its object to protect and develop the interests of the shipping trade. This federation assures regular work for the dockers, is gradually uprooting the evils of which the working classes complain, and by arbitration is amicably settling all disputes. The workmen are guaranteed an indemnity in case of lack of work, and mutual benefit associations among the dockers are favoured and encouraged. These associations supply the members with medical aid, old-age pensions, relief to the families in the event of sudden death, etc. All these privileges are made possible by subscriptions from both employers and employed. The success of the federation has exceeded all expectations, and now over 5,000 dockers have become members. Never has there existed a more complete understanding between masters and men than under these conditions. Day work has now proved so efficacious that

the necessity for overtime work has greatly diminished. The new Labour Exchange, which was opened on the 16th of March, is constructed in the very heart of the Antwerp maritime district. A similar institution is contemplated for the south end of the city.

In Germany the industrial situation shows little improvement as compared with a year ago, although the downward tendency has to some extent been checked. Employment has been more regular in the coal trade, but this was due to a larger export demand rather than to increased activity at home. In several large iron works hands have been discharged. The textile industry is also in a depressed state, particularly in the wool and linen sections.

A Labour Department and a Higher Council of Labour has just been established in ITALY. The principal functions of the Labour Department, which will be attached to the Ministry of Agriculture, Commerce and Industry, will be the compilation and publication of information relating to questions affecting labour in Italy and in those countries outside Italy which are selected as their destination by emigrants; to the regulation and remuneration of labour, to the relations between labour and capital, to the statistics of non-employment, to trade disputes, to industrial accidents, and to the effects of legislation and institutions in foreign countries, and the conduct of such enquiries as the Department may be directed to undertake by the Ministry, acting on its own initiative or on the request of the Higher Council of Labour. The Labour Department will publish (monthly, or at shorter intervals) a Journal which, together with its special reports, embodying results of its enquiries, will be sent free to such workmen's associations as may apply for these publications. The law imposes upon all local authorities and organizations of employers and of workpeople the duty of furnishing the Labour Department with such details as that office may request them to supply in order to enable it to carry on its work. The penalty for refusing to supply information asked for by the Labour Department, or for wilfully supplying false information, will be a fine of 5 to 50 lire (4s. to £2).

SCIENTIFIC AND TECHNICAL DEPARTMENT OF THE IMPERIAL INSTITUTE.

THE GEOLOGY OF ZULULAND.

Topography.—The topographical features of the province of Zululand may be separated into two distinct divisions—the Littoral and the Uplands. The littoral varies in width from about four miles at the Umlalaas Magistracy, to over twenty miles in the neighbourhood of False Bay, St. Lucia Lake. In general character it is flat or gently undulating, bounded on the west by the rising foot-hills of the Uplands and skirted on the east by the sand-dunes which separate it from the sea. The depth of the sand has been proved in places to be over 90 feet, and in many localities it is probably more. Most of the surface sands have been blown into their present position, but underneath they show distinct stratification and often false bedding, indicating that they had most probably been deposited in lakes and lagoons. Much of the littoral is occupied by impassable marshy areas, and often impenetrable scrub. It is also studded with innumerable brackish and salt water lakes, from small mud-holes up to St. Lucia Lake, whose surface area is about 100 square miles. Most of the littoral is open country, and it is only in the gullies of the permanently running creeks that the timber grows to a considerable height. The actual coast-line nearly as far north as the Umfolosi river presents at intervals more or less of a rocky character, these rocks being, however, only visible between tide marks, and they belong to the coal-bearing series with their associated volcanic rocks. Further north the rocks are of a less resistant nature, and have suffered disintegration. Taken as a whole the coast of Zululand possesses no natural harbours, and is of a most dangerous character to shipping. The rivers are blocked in all cases to navigation by sand-bars. There is distinct geological evidence that, since Tertiary times at least, the coast-line of South-east Africa has been slowly rising and becoming dry land, and the littoral represents what was in later Mesozoic times part of the coastal sea-floor. This raising of the land, and the formation of bars by means of the Agulhas ocean current, have been the means by which the lagoons have been formed at the mouths of the rivers.

The elevated country is chiefly formed of coal-bearing and volcanic rocks lying more or less horizontally, or with a slight dip eastward. Around Melmoth to the east of Eshowe, and to the north of Hlobisa, metamorphic granites, gneisses and schists occur, while large tracts of the Uplands are covered by basaltic outcrops, which sometimes represent contemporaneous lava flows, but more commonly sills and dykes which have been intruded among the coal-bearing strata. The latter have been denuded to great depths by the rivers which flow eastward to the coast, with the formation of extensive valleys. The southern portion of the Lebombo range rises abruptly from the flat littoral on the east, and on the west from an equally level plain. It is formed of a very siliceous rhyolitic rock, and its surface always presents a rough and rugged aspect, and is of the most barren description. The rocks forming the *Recent* and *Pleistocene* formations consist of the alluvial detritus which has been deposited by the rivers in the more open portions of their valleys and the points where they enter the littoral. They are rarely of any great thickness or extent, but where they occur they form fertile soils.

The *Cretaceous Rocks* usually outcrop where the littoral joins the foot-hills of the Uplands. There seems to be no doubt that this formation is largely developed over the northern portion of the littoral of Zululand, but is hidden in the majority of cases by the overlying Pleistocene and Recent sands. In boring for coal near the mouth of the Umhlutuzi river it was proved by two bores that a fossiliferous limestone identical with cretaceous limestone of the outcrops mentioned, exists at a depth of 70 feet and 90 feet, respectively, and there is every likelihood that the coal-measures also exist beneath this formation. The exposed fossiliferous beds of the cretaceous formation are all of marine origin and consist of conglomerates, calcareous sandstones, limestones, chalk and chalk marls. In the south at the mouth of the Umhlutuzi river, the cretaceous rocks in all probability rest unconformably on the coal-measures of the Umlalaas coalfield. Further to the north on the littoral they probably rest on the thick series of basaltic rocks which overlie the coal-measures of the Santa Lucia coalfield, as far north as the Umsinene river, and still further north rest on the Rhyolitic lava of the Lebombo range.

The Coal-bearing Formation.—The area in which coal is known to occur in Zululand is of great extent, covering, as it does, the major portion of the province, and stretching from near the Tugela river with a few local exceptions, where the metamorphic rocks appear at the surface, to the north of Nongoma and into Swaziland. To the north-east of the lower portions of the Umfolosi river and in the eastern parts of the Makowe hills, large developments of basaltic rock occur, overlying, and apparently conformable with, the coal-bearing strata. These evidently contemporaneous lava sheets often attain a considerable thickness. In

occurrence and character they bear a striking resemblance to the coal-bearing series of the high veld of the interior. The coal-bearing strata consist of shales, often fossiliferous, sandstones, and coals. They are seamed with dykes and sills of subsequently intruded basaltic rocks. Many bores have been put down in the various coalfields, but, in the majority of cases where coal was struck, it proved to be of a decidedly anthracitic character, although in some instances fairly good bituminous coal has been proved to occur. These bores were in all cases put down by private syndicates or individuals, with the assistance of Government, for the specific purpose of finding coal, and in no case has the bore done more than prove the presence of a seam or a basaltic sill, so that nothing is known of the deeper beds of the coal-bearing series. The usual succession is as follows. Dwyka conglomerate, black carbonaceous shales, with light coloured sandy-shales (the Ecça shales), sandstones, shales and coals (the Ecça coal-bearing series). The chief amount of prospecting and boring has been done on the Umlalaas coalfield, the nearest to the Natal railway. In a year or two the Natal-Zululand railway will be completed as far north as the St. Lucia coalfield, and should give an impetus to the development of this and the surrounding coalfields. The following is a list of the Zululand coalfields:—

- St. Lucia Bay coalfield (West of St. Lucia Bay).
- Umlalaas coalfield (East of Eshowe).
- Ntambanana coalfield (Lower Umfolosi).
- Umhlutzi Valley coalfield (North of Eshowe).
- Hlopekulu coalfield (Entonjaneni).
- Qudeni and Madhlozi coalfield (Kkandla District).
- Langagazi coalfield (Nqutu District).
- Nongoma coalfield (Nongoma).

The Umlalaas coalfield is bounded on the south-east by the sea, and on the north and west by the metamorphic rocks of the Engoye mountains; while to the south-west it merges gradually into the series of shales overlying the Dwyka conglomerate which form the undulating country towards the Lower Tugela. Unlike the St. Lucia coalfield, the strata are not overlaid by basaltic rocks. Most of the seams yet found vary in thickness from a few inches to 1 foot 8 inches, while in one bore 9 feet of alternating shales and coals occurred, the aggregate thickness of coal being between 4 and 5 feet. The St. Lucia coalfield is situated in the basin of the Nseleni river, and is bounded on the north and south by basaltic rocks. Coal-seams, with intercalated shales, occur in thickness from 6 to 15 feet. Little or no development has taken place here. Of the other coalfields little is known except perhaps the actual presence of a coal-seam.

Outcrops of the Dwyka conglomerate occur in various districts of Zululand. Its presence at the surface in any district is of importance from the fact that in most parts of South Africa the ores of metals of economic value occur chiefly in rocks which are older than this formation, and therefore have to be looked for below it. On the other hand, all the coal-bearing rocks are younger than the Dwyka, and therefore will occur overlying the glacial conglomerate.

Granitic rocks cover an area of over 300 square miles, east of Eshowe, and are of common occurrence in the western part of the province. Gold has been found associated with these rocks at the former place, where it occurs as very fine wire.

Basaltic rocks are usually associated with the Sedimentary coal-bearing rocks in the form of intrusive dykes or sills, which have forced their way between the beds, and rarely as contemporaneous beds which have been erupted during the deposition of the beds. They attain their greatest development immediately to the south and east of the St. Lucia coalfield. They form the Entondmeni mountains, and the eastern half of the Makowe hills. The deposits in the north of Zululand, supposed to contain diamonds because of their fancied resemblance to the diamond-producing deposits of Kimberley, have not only been proved barren, but the "yellow ground" has been shown to be derived from a different rock from that of Kimberley, and to occur under different conditions.

MINING AND CONCENTRATION OF COPPER ORES IN SOUTH AUSTRALIA.

The Wallaroo and Moonta copper mines are situated about 10 miles apart at the northern end of Yorke's peninsula, and are distant about 6 and 11 miles respectively, from the seaport of Wallaroo, on the eastern shore of Spencer Gulf. There is direct communication by rail between the port and the mines as well as to Adelaide. The smelting operations are conducted by the same proprietary at the port of Wallaroo. The mines have been in operation for about 40 years. They are now held under mineral lease from the South Australian Government for a lease of 99 years, at a rental of 1s. per acre per annum, and a royalty of 2½ per cent. on the declared profits. At the Wallaroo mines there are several ore-producing lodes, some of which are nearly parallel, and the general strike of the main ore body is about N.75°W. At the Moonta mines there are five ore-producing lodes, besides others of less importance; their average bearing is N.30°E. The total value of the ore produced in connection with these mines has amounted to over £10,000,000. The quantity of vein-stuff raised annually approximates 200,000 tons, giving about 37,000 tons of dressed ore. The amount of copper produced at the Wallaroo smelting works is about 4,800 tons, and the number of hands employed in connection with the mines is about 2,000. The main ore-raising operations are conducted at depths varying from 1,000 to 2,000 feet, and the deepest workings are now about 2,500 feet from the surface. At the Moonta mines the country rock consists of felsite porphyry, a plutonic igneous rock of an intensely hard character, having a specific gravity of about 2.67. At the Wallaroo mines the rock is chiefly a metamorphic mica-schist of possibly Cambrian age. As raised, the ore contains 2 to 4 per cent. of copper, and needs a comprehensive system of treatment in order to afford satisfactory results. The bulk of the ore at the Moonta mines can be concentrated with advantage to a product assaying from 15 to 18 per cent. of copper, but at Wallaroo the ore contains a larger percentage of iron pyrites and therefore does not usually dress to more than 10 to 11 per cent., although quite as free from waste as the Moonta concentrates.

At the Moonta mines the lodes are on the underlay, the dip varying generally from 50 to 70 degrees. Owing to this and the hard nature of the rock, the shafts are sunk for the most part with the lode, wheeled skips being utilized instead of cages for raising the ore to the surface. The main hauling shaft, 17 feet by 8 feet, is fitted with a double skip-road. At the Wallaroo mines the shafts are usually sunk vertically with cross-cuts extended at every 120 feet or so. At both mines the practice is to have shutes at the foot of the passes leading from the stopes, from which the broken vein-stuff is discharged into wagons in the levels. The roads in these levels are set to a slight run, of about ¼ inch to the foot, towards the main hauling shafts, so that the loads may be readily handled and the drives kept properly drained of water. At the Wallaroo mines the overhead method of stoping is followed, as being the most effective and economical in relation to the nature of the rock enclosing the lode material, whilst at the Moonta mines both the overhead and underhand systems have been followed extensively. The ore, after it is raised to the surface, is dumped on to iron screens which shoot the larger rocks in one direction and discharge the smaller in another. That which is smaller than 1½ inches is separated into three sizes, the rest is crushed in gyratory breakers, and again sorted and concentrated by machinery and hand. For concentration after the solid ore has been picked out, the lower grade stuff is passed through Cornish rolls and treated in the Hancock jig, which was invented to treat large quantities of this class of ore. The Hancock jig consists of a cistern 25 feet long, 4 feet wide and 6½ feet

deep, made of stout timber, supported by a cast-iron framing over a masonry-loading to give it rigidity. In the upper portion of the cistern is suspended a sieve 20 feet by 3 feet, by means of four vertical rods which connect it with the machinery giving the pulsating motion below. The mesh of the sieve is usually 4 to 5 holes to the linear inch, and on this wire bottom there are wooden cross-bars 3 inches apart and of the same depth, which form pockets. These contain a quantity of heavy, coarsely crushed material known as "ragging," generally a hard variety of hematite having a specific gravity of 5, while the ore to be concentrated is about 4. The cistern is usually divided into five separate compartments to receive the various qualities of ore produced. The cistern is filled with water and the sieve entirely submerged. The pulverized vein-stuff after passing through a slime-separator is automatically fed on to the head of the sieve, where the ore and waste are separated by the pulsating motion imparted, the heavier particles of ore work down through the ragging and thence through the wire bottom into the compartments below, while the lighter waste is carried on to the tail-end of the jig. The amount of motion in the machine can be easily increased or diminished according to the nature of the material which is being operated upon. The best concentrates are obtained from the first and second compartments. That from the others needs retreating and is often re-crushed. 150 tons of material may be treated in 24 hours on one machine; other machines on the same principle are used for treating coarser and finer material. The fine ore which is carried off from the jigs by the flow of water is allowed to settle in pits of various sizes, the first being smaller than those succeeding, on the principle of the *Spitzkasten*, and these grade the material to various degrees of fineness. The greater part of the slimes is treated on buddles. These revolving tables are either convex or concave and are used in sets of four, three being used for a first concentration and one for a second concentration of the enriched slime. Following on these is a further treatment by a special buddle, and a final concentration on a belt or table vanner. The cost of labour in connection with the slime dressing seldom exceeds 1s. 6d. per ton. The coarser tailings from the dressing appliances are stacked in heaps and the remaining copper removed by a leaching process. The heaps are periodically watered and, by oxidation of the sulphur, the copper is obtained in solution, and precipitated in a series of vats and canals by means of scrap iron. The precipitate is washed, freed from pieces of iron and despatched to the smelting works. This latter method is being greatly extended, so that heaps aggregating over 1,000,000 tons may be operated from a central station, on the principle of the method used at the Spanish copper mines.

ORANGE CULTIVATION IN JAFFA.

The efforts now being made to establish the cultivation of oranges on a large scale in several British colonies, and especially in the West Indies, renders it opportune to draw attention to an interesting article on the above subject in the current number of the German journal *Der Tropenpflanzer* (No. 7, 1902, 341), contributed by Messrs. Aaronsohn & Soskin, in which a full account of the trade in, and cultivation of, Jaffa oranges is given. It appears that, altogether, seven varieties of citrus are cultivated in that district, the following being their names and characteristics:—

Citrus aurantium (Portuguese orange). This is the Jaffa orange proper, and is the one so largely imported into England. It is probably a native of Portugal, but is now cultivated in two varieties which have little in common with the original stock. The variety popular in England is known locally as *Schamuti*, and differs from the second and less common kind, *Beledi*, in being larger and having a thicker skin and no seeds.

Citrus Bigaradia (Seville orange).—This variety is only grown as a stock for grafting purposes, as it has been found that an orange tree raised on this species bears fruit for a longer period than when grown in any other way.

Citrus medica (citron).—The two kinds of fruit raised from this species never come to England, but are exported to the countries bordering on the Mediterranean, and, to some extent also, they find a market among the Jews.

Citrus limonum (lemon).—This plant is never grown in Jaffa for the sake of its fruit, but, like the bitter orange, is used as a stock on which to graft the sweet orange. It is stated that the best and oldest orange trees of Jaffa were entirely raised on lemon stocks, but the experience of the present planting community is that trees so raised only bear fruit for six or seven years, and are, therefore, less profitable than those propagated from the bitter orange.

Citrus limonum var. dulcis (sweet lemon).—This species is also employed only as a grafting stock where orange trees are to be grown on the light sandy soil characteristic of some parts of this district. The trees so raised have the advantage of bearing in a short time. The sweet lemon itself is popular with the Arabs, and is, to some extent, grown at Akka.

Citrus nobilis (Mandarin orange).—This tree has been grown in Palestine only for a short time, but has spread rapidly. The fruit bears carriage well, and is therefore suitable for exportation, whilst the tree is small, and fruits readily.

Citrus decumana (grape fruit).—This species is rarely seen, and is nowhere cultivated as a crop in the country.

The production of oranges in the neighbourhood of Jaffa is carried on both by Arabs and by Europeans, but the methods adopted by the two classes are identical, with the exception that the European planters have, as a rule, adopted machinery where possible. One of the chief factors in successful orange culture is efficient irrigation, and every garden is provided with a well, from which water can be pumped, either by the primitive Arab methods or by the use of oil engines, to all parts by means of stone canals. The ground is dug either by direct manual labour, as the Arabs prefer, or by a plough cutting to a depth of from 19 to 38 inches. In this prepared soil seeds of the bitter orange or cuttings of the sweet lemon are placed, and the young plants produced from these receive no further attention beyond regular watering. After two years' growth, they are taken up and planted out in the orange groves. This transplantation takes place all the year round, without distinction of seasons. The young trees are planted very thickly, often not more than four or five square yards being allotted to each. After a further two years' growth in the orange garden proper, preparations are made for grafting the true Jaffa orange on the young stocks, usually towards the end of the summer season, although there is considerable risk at this time of the graft being killed by the cold weather which is apt to come on suddenly. The trees begin to yield well four or five years after the ingrafting has taken place; they receive comparatively little attention, but are watered about once a week, and the ground is turned over three or four times a year, in order to facilitate the passage of water to the roots. The chief enemies the orange-planter has to contend with are a group of insects resembling wood-lice, which infest all parts of the orange trees, and various vegetable parasites, which attack both old and young plants, and rapidly destroy them. The Arabs take no precautions to prevent the spread of these fungi, and even plant fresh young trees in the neighbourhood of old dead trunks covered with vegetable parasites of all kinds, so that an Arab orange garden often presents a pitiable spectacle to the eye of a modern cultivator. As regards the future of orange cultivation in Jaffa, the authors are of opinion that the present careless methods of the Arabs will, if persisted in, lead to a great falling off in production, as has already occurred in other orange-growing districts, such as Majorca, Sardinia, and St. Miguel; whilst, if a rational culture under European supervision could be secured, a considerable extension of the industry might be made, since, in face of the decreasing output of the other orange-growing districts, over-production is scarcely possible.

THE CULTIVATION OF SUGAR AND OTHER ECONOMIC PLANTS IN TRINIDAD.

A notice of the 14th annual report of the Royal Botanic Gardens in Trinidad was given in this JOURNAL (Vol. VII., p. 210); Report No. 15 by Mr. J. H. Hart, the Superintendent, has now been issued and covers from 1st April, 1901, to March 31, 1902. The experiments in connection with the raising of seedling sugar-canes have been continued; many gave a high percentage of sugar and a good average weight per acre; about 2 per cent. of the seedlings raised every year are selected for further trial. One of the canes when ten months old yielded over 20 per cent. of cane-sugar, and several others were nearly equal in value. A fine batch of young seedlings was planted out in March, 1902. There is every hope that some new and valuable seedling kinds will be eventually obtained by careful selection, but experience shows that it is inadvisable to recommend any one kind until it has had full field trials on a large scale. Several of the best seedlings have already been distributed to planters, and others will follow as they appear from primary experiments to be worthy of trial. 92,000 cuttings were distributed. Analysis showed that there were many varieties yielding over 20 per cent. of cane-sugar, and one as high as 21.63 per cent. If these figures are maintained on further trial an important improvement in sugar production will have been effected. Some of the older canes have yielded on the poor soil at St. Clair 20 to 30 tons to the acre as 1st ratoons, calculated on areas of not less than one-twentieth of an acre.

In rubber cultivation *Castilloa elastica*, planted in 1898, is now over 25 feet in height, and some of the trees have stems 5 inches in diameter. It has been found that rubber fluids or latex from these young trees produce rubber inferior in quality to older trees; only those eight or ten years old can be depended upon to furnish rubber of good quality. It was anticipated that rubber material could have been extracted from one-year old trees, but this has proved illusory, for although chemically the rubber is there, it is not in such a condition as to make it of market value, and up to the present no chemical process has been devised which will change the soft and sticky material obtained from young trees into the hard and elastic produce afforded by mature trees.

The Para rubber plants (*Hevea brasiliensis*) put out in 1898 at the same time as the Castilloa trees, fully equal the latter in height, but have not so large a stem circumference; they promise to thrive in the Trinidad climate. The trees of West African, "Ire" or Lagos, "Silk rubber" (*Funtumia elastica*) made splendid growth during the year; some, although not yet four years old, were over 20 feet in height with a stem diameter of four inches. From present appearances it is a tree that will stand probably more hardship than any of the other rubbers, as it can bear exposure to the sun, although it does not grow fast in such situations.

Numerous other economic plants have been grown, and the results are recorded in the report. Some new varieties of coffee raised from home-grown seed of *Coffea stenophylla* fruited in the year; the berries were fairly large and differed much in this respect from the type, but had the same purple colour. The beans when cleaned were about the same size as ordinary *C. Arabica*. The berries had a thin skin and the interior parts were intermediate between *C. Arabica* and *C. Siberica*; in fact they are probably natural hybrids between *C. stenophylla* and *C. Siberica*. Some of the varieties are more fruitful than others, and it is intended to give the best varieties local names and propagate them by grafting. One has been named "Commissioner" coffee, and several successful grafts have been taken from this kind, the stock used being the strong growing Siberian. They were favourably reported on by Messrs. Woodhouse and by Messrs. Wilson, Smithett and Co. The value of the coffee from a grower's point of view is that it grows faster and better and fruits earlier than any variety of *C. Arabica*, and does not require so much shade; while it is not so tall growing as the Siberian; and the varieties appear to promise a hardy and easily cultivated strain of considerable value.

Both the West Indian and the Honduras varieties of mahogany (*Sweetenia mahogani*) have been grown and have been found to be quite distinct; the Honduras variety having made over double the growth of the West Indian kind in exactly the same soil. It is strongly recommended that the Honduras variety should be planted wherever possible, as it has proved to be a tree well suited to the climate.

The possibility of growing camphor (*Cinnamomum camphora*, Nees) is now a matter of interest owing to certain monopolies in Formosa. In Trinidad it grows rapidly but never makes a large tree. The wood contains a fair amount of camphor and some camphor oil; specimens of these were lately manufactured at St. Clair. The camphor was of good quality and the camphor oil was excellent; more of the oil was produced from the young wood than from the older stems. It is intended to grow a plot with a view of testing the feasibility of growing it on a commercial scale. Trees planted three years ago are now ten feet in height; it propagates readily by layers.

CULTIVATION OF FRUIT IN FLORIDA.

With a view to promoting the cultivation, on a large scale, of pineapples, oranges, etc., in Jamaica, Mr. Robert Thomson, late Superintendent of the Government Botanic Gardens of Jamaica, has recently investigated the methods employed in the fruit plantations of Florida. His report to the Jamaica Board of Agriculture discloses many interesting features in the cultivation of tropical fruit. For pineapples, which are grown in many districts, a system of shed culture has proved successful. Until about twelve years ago this fruit was grown in the open, but one or two severe frosts destroyed nearly the whole of the plants, and it was found necessary to afford them protection, both against frost and the tropical sunshine. The sheds are made of close boarding 7 to 8 feet high and partially covered with thin laths, openings being provided to admit the requisite light and air to the plants; during the frosty nights canvas sheets are placed over the sheds as an extra protection. The plants flourish very well under these conditions, and 80 to 95 per cent. of them bear fruit; about 200 acres of land are under cultivation, an average pinery consisting of five to twelve acres. The cost of erecting sheds, which last about seven years, averages \$300 per acre, the canvas costing about the same; the suckers, which are planted to the extent of 9,000 per acre, cost \$900 and the fertilizers about \$100 per acre annually. The first crop, which is taken within twenty months of planting, is calculated to pay all expenses; the price obtained per crate of twelve to sixteen fruits is about \$3 for the best varieties, and less for smaller fruit, a little difference in size making a considerable difference in the price. Some of the growers replant after each crop, some after two crops, very rarely at longer intervals.

Jensen, on the Indian river, one of the southern districts, contains several thousand acres of pineapple plantations; only a small proportion are under sheds, the growers relying, as a protection from frost which is much less prevalent, on the very close planting of the suckers (12,000 per acre), and on the greater hardihood of the varieties they cultivate. From this district 200,000 crates, containing about six million fruits, are shipped to the northern cities annually; the yield of fruit per acre is about 8,000 to 9,000, and on occasions up to 15,000; the replanting is usually done every eight to ten years, but in Mr. Thomson's opinion half that interval only should elapse. The food for the plants is furnished by fertilizers. In all the districts visited, the soil was found to consist of 96 to 98 per cent. of sand or silica, one analysis showing 99.4 per cent. of insoluble residue; the fertilizers are mixed by the grower to suit his own conditions of cultivation, they contain ammonia and potash and are thrown between the rows of plants and raked in to the top surface of soil. The average annual rainfall is from 50 to 60 inches. Jamaica at present exports annually about 65,000 fruits, the yield per acre being very low and capable of great improvement; the soil is not sufficiently sandy and is too rich, but there are many parts of the island highly suitable and which are not under the slightest cultivation.

Prior to 1895 the cultivation of oranges was the greatest industry in northern parts of Florida, but in that year a severe frost killed every tree and ruined several thousand growers, but at the present time many plantations are being cultivated further south; before 1895 the annual export was about five million crates, but after the frost referred to it was 100,000 crates, rising to 750,000 last year. Great care is given to the packing of the oranges, an important point to which insufficient attention appears to be paid in parts of Jamaica, which has now a much larger export of oranges than Florida.

A growing industry in Orlando is the cultivation of cassava; this plant appears to grow well on the sandy soil, the annual yield per acre being about 9 tons. From the cassava tubers the production of starch and the manufacture of tapioca and dextrine is to be taken up. The cultivation will probably be successful, since there will be a considerable local demand for cassava as a cattle food, and it will furnish starch to the great cotton factories further north, and owing to its high content of starch (17 to 20 per cent.) and sugar (3 per cent.) and low fibre value (1.68 per cent.), it appears a more suitable material than corn from which to manufacture glucose. As a food for cattle cassava is stated to be better and cheaper than either cotton seed or corn, and it will grow under conditions unfavourable to other food-stuffs. In view of this Mr. Thomson recommends the extensive cultivation of cassava in Jamaica; it is very profitable, no fertilizers being needed, although a small quantity is required for its growth in Florida.

CACAO CANCER.

This disease, which has been in existence for ten or twelve years, has lately been fully investigated by Mr. J. B. Carruthers, the Government Mycologist in Ceylon. Its origin is a fungus belonging to the genus *Nectria*, which mainly attacks trees of three or four years of age, death occurring within a period of four months to three years, differences of soil, elevation, etc., having no effect on the vitality of the parasite, which appears always to attack the branches and pods of the trees, and to be unable to exist on the leaves and roots. It consists of the mycelium—a reddish brown semi-liquid substance permeating the bark and stem, which prevents the passage of moisture and nutrition to the leaves;—and pods which die and drop off;—the spores, minute seed-like bodies which appear in pinkish-white clusters on the mycelium; and the ascospores, which are only found on dead or very much diseased cacao trees, and are small hollow bodies containing "sacs," each of which bears several spores.

It was found possible to inoculate healthy trees with tissue impregnated with mycelium; over 80 per cent. showed distinct symptoms of canker by the end of eight weeks. The infection of the suckers proved much more difficult, owing probably to the smoothness of the bark and its freedom from wounds; it was also found impossible to convey the disease to the roots and leaves. These facts show that suckers may be grown from old stumps after the diseased stems have been cut down, and that new trees may be planted beside the roots of cankered trees without fear of infection. The pods are readily infected with the disease, which develops rapidly and frequently spreads through the twigs to the stem of the tree. During the investigations another fungus (*Phytophthora species*) was found to be almost invariably associated with the *Nectria*, from which it could not be freed, so that its behaviour could not be observed.

The spread of the disease is due to the distribution of the spores by such agents as wind, rain, rivers, and small animals; many cases of infection had occurred, proving their propagative nature.

Several methods of prevention have been devised and tested with good results; for the first few months after a tree becomes infected the only indication is the discoloration due to the mycelium. The surest remedy is to cut the diseased patch out of the tree, a large margin (2 or 3 inches) round the discoloured portion being removed as well, otherwise the canker will not have been completely eradicated. The average annual expense entailed by the inspection of the cacao, and the cutting out of the disease, varies from Rs. 15 (£1), on a bad estate, to Rs. 3, per acre of plantation. Another effectual remedial method of treatment is to shave off the surface of diseased bark and submit the exposed stem to direct sunlight or to artificial heat supplied by charcoal braziers, the effect being to dry up and kill the mycelium. Damage to the tree tissue sometimes results from this treatment. When the pods of the tree become infected the course of the disease is very rapid, lasting only a few days. At the least indication of fungus, they should be picked off and burnt or buried in quicklime, as they are of no value, even when only slightly cankered, and are a fruitful source of infection to other trees and pods.

The effect of spraying the trees with solutions of such agents as copper sulphate, lime, etc., has been tried, but in rainy seasons when the canker is prevalent the deterrent is rapidly washed off. Tar has also been used to cover over diseased patches, but cases frequently occur of the fungus vigorously spreading underneath it. Mr. Carruthers finds that healthy trees are just as liable to attack as weak ones, and he considers that most attention should be directed to cultivating by selection a variety of tree which will withstand the disease. The pods of such should ripen during the dry hot season, they should be thick and smooth skinned, and the bark of the tree should have as smooth a surface as possible. At present some varieties have a very rough and broken surface—bark on which the spores readily lodge; others have a smooth, even stem. The time at which the pods mature varies with different varieties. Considerable progress has been made in the extermination of the canker, and there is reason to hope that it may be completely eradicated.

THE TARQUAY GOLDFIELD, GOLD COAST.

A narrow gauge (3½ feet) railway which is being constructed from Sekondi on the coast to Koomasi passes through the goldfield, and is already open for traffic as far as Tarquay, which is situated about the centre of the south-eastern edge of the goldfield. The reefs in the goldfield are conglomerates occurring in a sandstone and quartzite formation. The latter vary from fine-grained rocks to grits, and often contain pebbles, but at a depth change to quartzites. Like the rocks of the Rand these reefs contain a large quantity of iron oxide, which mostly occurs in thin bands or veins and gives the sandstone or quartzite a striped appearance. Interbedded with these rocks are several beds of dolomite. The total thickness of the formation is estimated at between 4,000 and 8,000 feet. It is overlain by a clay-slate formation of probably 1,000 feet thickness. The enclosing formations are mostly basic igneous rocks, schists and slates. The goldfield has a tendency to a long syncline trending about 40 degrees north-east. South-west of Tarquay this syncline is perfect, and there is no doubt that the Tamsoo and Teberibi reefs which dip in opposite directions are one and the same, but at Detchikroom it is much disturbed. The south-eastern edge extends from Busumchi to Tamsoo, a distance of 20 miles; at the latter place a powerful disturbance appears to have thrown the whole formation north-westward about 9 miles. In and around Tarquay the sandstone-quartzite formation has an area of over 100 square miles. At Tamsoo the reef is roughly 10 feet thick, consisting of alternate layers of striped sandstone and conglomerate. At the Wassan mine the reef has a very steep inclination near the surface, but decreases to 47 degrees at a depth of 700 feet from the surface. The reef in the Bishop's shaft has a thickness of 12 inches with sandstone on either side. At Cinnamon Bippo it has a thickness of 3½ feet in one place, and 20 inches in another, and the dip varies from 38 to 50 degrees. The reefs in other parts of the field appear to be similar in dimensions, and dip, to those quoted, but increase at Teberibi mine to 50 feet. In many respects the formation resembles that of the Rand. The dykes occurring in the goldfields consist mostly of basic igneous rocks, which are either dolerites or diabases. Very little work is being done on the goldfield, except boring. There is no question as to the permanency of the conglomerate beds in depth. As to the value of the ore, not sufficient work has been done to form a correct estimate, but the beds differ in thickness, being considerably thicker at the south-western incline than at the north-eastern end, and the thicker they are the lower the grade.

WEST INDIAN TIMBERS.

(By JOHN T. REA, F.S.I., Surveyor, War Department.)

(Concluded from p. 213, August JOURNAL.)

60. MAMMEE APPLE (*Mammea Americana*). Found in most of the islands. Also known as the South American Apricot. A tall handsome tree, about 80 feet high and 30 inches diameter, with vertically growing branches and dark green glossy leaves. The wood is dense, hard, and heavy, and of a purple or reddish, brown colour. It is very durable, stands damp, and is good for rafters, boards, furniture, and cabinet-making. Weight, 60 lb. per foot cube. The bark is used as a medicine by the natives. A kind of wine is made from the shoots, and a scent from the wild flowers. The gum destroys the chigoes, or "jiggers," in the feet of the negroes.

61. MAMOORI-BALLI, from the Moraballi creek, Essequibo river, British Guiana. This tree is plentiful in Essequibo, and grows best in sandy soil. The average height is 70 feet and it can be had to square 16 inches. The wood is tough and hard, and is suitable for house-framing and other work where it will not be exposed to the weather.

62. MANCHINEEL (*Hippomane Mancinella*). Grows in most islands, and generally found on sandy sea-shores. Sometimes styled the Manzanillo tree. The wood is of a tawny yellowish colour, beautifully variegated with brown and white, resembling maple and smelling like lavender. In some islands it is highly prized for furniture and ornaments, and in St. Lucia for studs, verandah floors, boarding, etc., as it is lasting for outside work. It is said there are seven different varieties in St. Lucia, and that some do not blister. Weight, 50 lb. per foot cube. The fruit has the appearance of an apple, but is a virulent poison; and the whole tree abounds with a milky white juice, which is also of an acrid quality. If a single drop of this juice touches the skin it causes a hot sensation, and raises a blister on the part, the antidote being the adjacent sea water. Blindness is likewise produced if the milk comes in contact with the eyes. Careful felling is required, and it is first necessary to kindle fires around the stem to thicken the noxious sap.

63. MANGO (*Mangifera Indica*). Found in every part of the West Indies, where it was introduced in the eighteenth century from the East Indies, and now grows spontaneously. It is a large umbrageous tree, very plentifully distributed, growing to 3 feet diameter, and 40 feet high. The leaves are pointed and thickly set. Gives a pretty red wood, of inferior quality, coarse, open grained, and soft. It is durable in dry, but decays if exposed to wet, and is much eaten by white ants. It has only a few special uses, but being plentiful and cheap it is frequently employed for common work; but not for beams, as it is liable to snap off short. Weight, 42 lb. per foot cube. Cohesive force, 7,700 lb. Breaking weight, 560 lb. The tree produces a delicious and popular fruit, and the gum is used internally for diarrhoea and dysentery.

64. MANGROVE (*Rhizophora*). Found in the islands where there are swamps. There are three kinds—Black Mangrove (or "native oak"), Red Mangrove, and White Mangrove. The black mangrove is only to be found in wet places, within two miles of the sea. It is called "native oak," which it resembles, but it is darker and harder. The usual size is 30 to 50 feet high, and 15 to 20 inches diameter, being the best wood for piles and poles, and even more durable than white cedar, but it is comparatively rare.

The red mangrove belongs to the same family, only instead of being dark brown it is red, and the leaves are more pointed. The average height is 60 to 80 feet, and diameter 15 to 20 inches. Generally used for pilcs, poles, fence posts, and for building purposes.

The white mangrove is likewise of the same order, but the wood is white, and the leaves are almost round. Frequently employed for building, and is much used locally for ship-building, furnishing "knees" that require little moulding to the necessary shape. Average size is 60 to 80 feet, and diameter 15 to 20 inches.

The mangrove grows in a peculiar manner in swamps, the seeds aerially germinating in the fruit and forming long roots dropping to the ground, eventually creating a complicated labyrinth of inter-dependent trees. Mangrove roots solidify the mud where they vegetate, and raise it, and their sanitary value is increased from the tannin yielded to the mud by the falling leaves, bark, and seeds, which is a powerful antidote against putrefaction. From its astringency the bark is in some places used for tanning, being well known to contain an abundance of tannin. All the three varieties of mangrove are employed in house building, and occasionally in cabinet work.

65. MANNIBALLI, from the Moraballi creek, Essequibo river. It grows in dry situations, tall and straight, to an average height of 100 feet, with a very small top; it can be had to square 20 inches free of sap. The wood is most durable when free of sap, and is superior to greenheart where small sizes are required. It is close grained, and of a brownish yellow colour, and produces a sticky yellow gum.

66. MASTIC, or Gommier, or gum tree, (*Busera gummifera*). Found in Jamaica, Trinidad, St. Lucia, Dominica, etc. There are four varieties of this tree quite distinct from each other, namely, the Gommier blanc, Gommier gris, Gommier l'encens, and the Gommier maudit. One of the largest trees in the islands, with a buttressed base, and 3 to 6 feet diameter. The two former kinds are the largest, and are made into native pirogues, or dug-out canoes, by hollowing out the trunk.

The gommier l'encens, or Incense tree, produces a whitish fragrant gum, which exudes on the slightest scratch and is burnt as incense in the Roman Catholic churches, and used as a disinfectant. This resin is likewise wrapped in leaves of the balisier and made into torches or flambeaux, and is employed as a substitute for gum-mastic in making varnishes.

The gommier maudit is grown as fences, as it lives for an indefinite period, while the gum is serviceable as a plaster.

67. MORA (*Mora excelsa*). This tree comes from the Issorooro creek, Upper Pomeroon river, British Guiana, and from Trinidad. It grows luxuriantly on sand-reefs and barren clays of the coast regions, reaching 130 to 150 feet in height, and squaring 18 to 20 inches. It often attains a height of nearly 200 feet, but in such cases has generally a hollow trunk. For market form the logs are 18 to 35 feet long, and 12 to 20 inches square. It can even be had to square 24 inches, free from sap and holes. There are three sorts, known as Red Mora, White Mora, and Morabucquia. The first two grow in swamps and near the rivers and creeks, and are both very durable woods. Morabucquia on the contrary grows in high situations in clayey rocky soil, and is not a durable wood. Mora is of a chestnut-brown colour, hard, heavy, tough, strong, and generally straight in the grain, but has occasionally a twist or waviness in the fibre which imparts to the logs possessing it a beautifully figured appearance, giving to them much additional value. It is very close grained, and its exceeding toughness makes it most difficult to split. When clear of sap it is very durable, whether in or out of water, and has never been known to be attacked by dry rot. By competent authorities it is considered to be superior to oak, and to vie in every respect with teak. As it takes a good polish it would be useful as a substitute for rosewood or dark Spanish mahogany in cabinet-making, and might be employed for many purposes in the domestic arts. The economical uses of mora are somewhat restricted by the frequency of star-shake in the logs, and only the best trees can be advantageously converted into planks and boards; it may, however, be used with greater profit for beams, keelsons, knees, engine bearers, etc., in shipbuilding, and in a general way in large scantlings for either civil or naval architecture. Mora possesses great strength, and is one of the eight first-class woods at Lloyds. It contains an oily or glutinous substance in its pores, which

is probably conducive to its durability. Weight, 65 lb. per foot cube. Crushing strength, 5'33 tons per square inch. The bark is used for tanning, and medicinally in cases of dysentery. The seeds are employed by the Indians to make a kind of meal, which is mixed with their cassava. Mora grows to a greater size, and is more plentiful at the Barima river than in any other part of British Guiana.

68. OLIVIER (*Bacida Buteras*). Found in Trinidad, Dominica, etc. A large tree, 30 to 50 feet high, which grows very rapidly, and reaches 2 to 4 feet diameter. The timber is valuable, being used for boards, planks, and all kinds of work inside and out. It is very durable in water, and excellent for shingles. The wood is difficult to ignite, and does not flame. Value, about £8 per ton.

69. OOLU, from the Itoori-bisei creek, Essequibo river, where it grows plentifully in loose sandy soil. The wood has a strong aromatic scent, is of the colour of pale cedar, and should be useful for drawers and shelves of wardrobes. The average height is 90 feet, and it can be had to square 16 to 18 inches. Oolu produces a gum, which is burnt as incense.

70. ORANGE TREE (*Citrus Aurantium*). Found in all the islands. A comparatively small tree, bearing the well-known sweet fruit. The wood is very tough, and can be utilized as handles for axes, hatchets, and other tools. The flowers, leaves, and young shoots yield an oil employed in the preparation of perfumery.

71. PAKOORIE, from the Itoori-bisci creek, Essequibo river, where it thrives best in loose sandy soil. The average height is 80 feet, and it is a tree the trunk of which is very large compared with its height, squaring 36 inches free of sap. When arrived at maturity this is a very durable wood, and is used for house-framing and many other purposes. The tree produces an edible fruit of the size and colour of a large orange, and a yellow sappy gum that is considered valueless.

72. PIMENTO (*Pimenta vulgaris*). Found in Jamaica, Trinidad, St. Lucia, etc. Also called Allspice, Baywood, and Jamaica Pepper. This tree is a species of myrtle, and grows to a height of 50 feet and 20 inches diameter, with a smooth brown trunk and shining green leaves, like those of the Bay. Obtainable in barks, 20 feet by 12 inches by 12 inches. There are two kinds of the wood, black and red, and it is employed for posts, fences, sleepers, and for naves and felloes of wheels. It is also sent home for umbrella and walking sticks. The number of pimento sticks exported from St. Lucia reaches 35,000 per annum. Bay rum is distilled from the leaves, which have a strong pleasant smell, and the berries are known as a spice and converted into a liqueur. Oil of pimento is obtained by distillation from the fruits.

73. POUI, black or ebony (*Tecoma serrati folia*). Grows abundantly in Trinidad, and is one of the hardest and most durable woods in the colony. There are two other colours, grey and green. The height is from 30 to 50 feet, and 2 to 3 feet diameter. The wood is used for posts, etc., has a peculiar odour, and takes a fine polish. Value is about £10 per ton.

74. PURPLE-HEART (*Copaifera Martii*), comes from Trinidad, and the Pomeroon river, British Guiana. There are two kinds—Koorooorelli and Marawinaroo. The bark of the latter (which is not so durable, and is a more sappy wood than the former) is used by the Indians for making canoes, or "woodskins." These are sometimes of large size, accommodating 15 or 16 persons. Purple-heart is one of the tallest forest trees, and has an average height of 120 feet. There are many of the trees even 200 feet high, and they can be had to square 30 inches free of sap. The wood is of a deep blue purple colour, exceedingly pretty, hard, close-grained, durable, and tough. It is durable for ornamental furniture, cabinets, wooden tea-trays, etc., and is adapted for house-framing, mill-beds, and other structural purposes, on account of its resistance to great strains. Weight, 63 lb. per foot cube. £12 per ton have been obtained for purple-heart when exported to the United States; usual value £10 per ton.

75. PRUNE TREE (*Prunus Occidentalis*). Native of the West Indies, Guatemala, and Panama. A high tree, growing to 3 feet diameter, with the well-known fruit. The wood is of a red colour, resembling cedar, and is very hard and durable. It takes a fine polish, and makes beautiful flooring; also lasts well in water, and is good for piles. From the kernels an excellent liqueur is prepared. Weight, 66 lb. per foot cube. Crushing strength, 3'43 tons per square inch.

76. RED CEDAR (*Juniperus Virginiana*). Found in a great many of the islands. A light, but dense, fine grained wood, obtainable in scantlings up to 12 inches by 12 inches. The heartwood is reddish-brown, the sapwood is white, straight grained and porous. It is easily worked, shrinks little, and is durable when well ventilated. Useful for joinery and boarding, and has a pleasant smell. Pencils being made of it, it is styled "Pencil Cedar." The tree grows in rocky soils and in dry situations, and is closely related to the Bermuda cedar (*Juniperus Bermudiana*).

There is also a Red Cedar (*Icica altissima*), which comes from the Issorooro creek, Upper Pomeroon river, British Guiana. This tree averages 100 feet in height, and can be had 40 inches diameter; it generally grows in low situations in clay soil. The wood is most valuable and very serviceable, and has little sap.

77. ROSEWOOD (*Dalbergia sp.*). Found in British Honduras, St. Lucia, etc. A tree 30 to 50 feet high, and 3 feet diameter, with well-known rosy and dark brown coloured wood. Very valuable for all kinds of housework, furniture, and cabinet-making, as it is exceedingly ornamental and takes a good polish. Weight, 74 lb. per foot cube. Crushing strength, 5'71 tons per square inch. Owing to its weight it is difficult to transport by water, being heavier. About 200 tons are exported annually from British Honduras. Ziricote is a description of Rosewood, also from Honduras.

78. SANTA MARIA (*Calophyllum calaba*). Found in British Honduras, Jamaica, etc. An important forest tree, yielding second-class timber. The height is as much as 150 feet, straight as a ship's mast, and up to 4 feet diameter. The wood is very abundant and on that account much used for building, although it is not considered durable. It is suitable for heavy machine work, and unsurpassed for shipbuilding. Shingles of an inferior class are split from it, the wood being hard. The seeds abundantly yield an oil for lamps.

79. SAPODILLA, Naseberry, or Bullet tree (*Echras Sapota*). Found in nearly all the islands. A tall fruit tree, with few branches and dark green shining leaves. It grows as much as 30 inches diameter and 100 feet high. The wood is heavy, hard, durable, and dark red in colour. There are two varieties, black and red. Adapted for inside house work, cabinet-making, and furniture, but difficult to work on account of its extreme hardness. Weight, 74 lb. per foot cube. Crushing strength, 4'30 tons per square inch. The bark and seeds have medicinal properties. Owing to the great weight of the wood the logs cannot be floated down the rivers to the ports. If this difficulty of transportation is overcome, say by the introduction of railways, the wood must find its way to European and other markets in much larger shipments than is now the case.

80. SATINWOOD, WEST INDIAN (*Fagara flava*, Kr. and Urb.). Found in British Honduras, Dominica, St. Lucia. Called satinwood from its lustrous surface, but in Dominica it is named Yellow Sanders, or Noyer. The tree is comparatively small, about 30 feet high and 2 feet diameter, but produces a fine hard wood, with agreeable smell, and showing on its polished surface a beautifully rippled pattern. It is of a lemon colour, very pretty, and is durable in the ground. Great favourite for veneering, panels, cabinet work, and

furniture, but can only be procured in lengths up to 20 feet. Weight, 60 lb. per foot cube. Crushing strength, 4·31 tons per square inch. It is worth £6 to £7 a ton, in squared logs, in the London market. Satinwood is reported to be plentiful in British Honduras, but is getting scarce in St. Lucia.

81. SEASIDE GRAPE (*Coccoloba uvifera*). Found in Jamaica, Trinidad, St. Lucia, etc. A crooked tree about 2 feet diameter, the timber of which is chiefly used for boat-building, as in the ribs of canoes. In Honduras it grows into a large tree. The leaves are very large and interspersed with red veins. The wood is hard, takes a fine polish, and may be employed for fancy work. It yields an astringent extract, and the fruit grows in clusters like small grapes. Weight, 65 lb. per foot cube. Crushing strength, 2·51 tons per square inch.

82. SEEBADANI, from the Moraballi creek, Essequibo river. This tree grows in clay and sandy soil, and has an average height of 90 feet. The wood is used for framing purposes, and can be had in large quantities; it will square up to 20 inches, and has very little sap.

83. SIMARUBA, Bitter Ash, or Quassia (*Quassia amara*). Found in Jamaica, Trinidad, St. Lucia, etc. Called Maruba in Grenada. A lofty tree up to 60 feet and 3 to 4 feet diameter, found in the deep forest. The wood is bitter, and will not be touched by white ants or other destructive insects; hence it is liked for inside work, boards, etc. The tree likewise furnishes the quassia or bitter wood of the chemists, from which cups are made for holding water to produce a tonic draught. The bark is known as the drug quassia, containing quassine, which is sometimes employed as a substitute for quinine. This bark was a famous Carib remedy for dysentery.

84. SIMARUPA (*Simaruba officinalis*), from the Itoori-bisci creek, Essequibo river. It is plentiful throughout the colony, and grows to a large size on sandy soil and on islands in the river. The average height of the tree is 90 feet, and it will square 24 inches. The wood is of a light colour, light and close-grained, and is one of the most useful for partition boards and other inside house work. Wood-ants will not eat or injure it. The bark of the root is used medicinally in cases of diarrhoea. Simarupa appears to be another variety of Simaruba.

85. SIRIS TREE, or Woman's Tongue (*Albizia Lebbek, Benth.*). Found chiefly in Jamaica. The wood seasons, works, and polishes well, and is fairly durable. It is used for furniture, boats, sugar-cane crushers, oil mills, picture frames, etc. Weighs 40 to 60 lb. per foot cube. The leaves are said to be useful in ophthalmia, while the seeds are astringent and the oil extracted from them is useful in leprosy. The bark is applied to injuries to the eye, and is employed in tanning. The gum is used to adulterate gum arabic in calico printing, and in the preparation of gold and silver leaf cloths.

86. SOAP BERRY, or Savonnette (*Pithecolobium micradenium*). Found in most islands. There are two kinds—the Yellow Savonnette (or little leaf), and the Gray Savonnette (or large leaf). The berries and leaves, on account of their peculiar saponaceous matter, are used in washing, by pounding and rubbing on clothes, the word savonnette indicating a "wash-ball." The seeds also possess medicinal properties.

The yellow savonnette is a big tree, seldom found in the interior. The wood is of a light brownish colour, employed for furniture, yokes, naves, felloes and boards. Weight 60 lb. per foot cube.

The gray savonnette is twice the size of the former, and rarely found near the sea. It is used for naves and felloes of wheels. Weight, 54 lb. per foot cube.

87. TAMARIND (*Tamarindus Indica*). Grows almost everywhere in the tropics, including the West Indies. It is a large tree, common on open plains. The wood is heavy, tough, and elastic, of a yellowish-white colour, with irregular blotches of purplish-brown heartwood. It is very hard and difficult to work, and is applicable for turnery, handles of axes, hoes, and other tools. Transverse breaking strain—6·68 cwt., of a piece 1 inch square and 12 inches bearing. The fruits have an acrid taste, and are made into a preserve.

88. TAWARONERO, or Bastard Bullet tree (*Humirium floribundum*). This tree is plentiful in British Guiana, and grows on sandy soil and near swamps, but not in them. The average height is 90 feet, and it can be had to square 20 inches free of sap. The timber is useful for framing houses, wheel-spokes, and many other purposes, and where small-sized timber is required it is superior to greenheart. The tree produces an edible fruit about the size of a grape. At the expiration of a week or ten days after cutting away the bark from the stem of these trees, a minute fungus, emitting an agreeable perfume, grows upon them. This is scraped off and used by the Indians for scenting their hair-oil. Tawaronero produces a gum similar to bullet tree, but in much smaller quantity.

89. WADADURI, or Monkey pot, (*Lecythis grandiflora*), from the Moraballi creek, Essequibo river. There are two varieties of this tree, plentiful throughout British Guiana, distinguished by the size of their leaves and the places where they grow. The small-leaved kind grows to a large size on sand and clayey soil, and attains to an average height of 100 feet. It can be had to square 28 inches free of sap. The broad-leaved sort grows in swampy places, and is a much smaller tree; its wood is not so durable as the small-leaved variety. It is used for furniture, house-building, etc., and formerly for hoghead staves. The tree bears a nut which is sometimes eaten, and a fine oil can be extracted from the kernels.

90. WAIBAIMA, from the Moraballi creek, Essequibo. This tree is a species of Cirouaballi or Siruaballi (*Nectandra*, or *Oreodaphne*). It is numerous about the Essequibo and Demerara rivers. The average height is 90 feet, and as there is little or no sap, the timber can be had to square 20 to 28 inches. The wood has a strong aromatic scent and bitter taste, and is about the best wood in the colony for planking vessels. For planking and all other purposes of shipbuilding for which greenheart is used, this wood is superior, and deserves to be classed among the first-class woods at Lloyd's.

91. WALLABA (*Eperua falcata*), from the Moraballi creek, Essequibo river. The tree grows in loose, sandy soil, over extensive tracts of country, and is well-known to every one in British Guiana. There are four varieties, two of which are never used. From the others frames for houses are made, vat staves, paling staves, and especially shingles, both for colonial use and for export to the neighbouring colonies. Wallaba wood is of a deep red colour, hard and heavy, and, being impregnated with a resinous oil, it is very durable in wet situations; hence its value for shingles. These trees are all plentiful, and have an average height of 80 feet, and can be had to square 20 inches free of sap. The scraped root of the Itoori wallaba is used by the Indians as a cure for toothache.

92. WAMARA, from the same locality, but is more plentiful above the rapids of the Essequibo river than below. It grows on sandy soil, and averages 60 feet in height, and squares 12 inches free of sap. The heart is exceedingly hard, heavy, and very close-grained, resembling ebony. The sap wood, of which there is very little, is of a yellowish-white colour; on exposure to the weather it rots away from the heart rapidly. The Indians make their clubs from this wood. It is little used in the colony owing to its extreme hardness, but it is a fine wood for inlaying and other cabinet work.

93. WEST INDIAN CEDAR (*Cedrela odorata*). This tree is a native chiefly of Honduras, Cuba, and Jamaica, having a stem about 80 feet high and 4 feet diameter, or even 6 feet in the open. It is quick-growing, with vertical branches, the wood being dark red or brown, fissile, opened-grained, but soft and porous. It is slightly absorbent of water, and has a

sweet, peculiar smell. Used for joinery, furniture, planks, and shingles. This cedar is most suited for wardrobes, as its odour repels moths and other insects; also considered the best wood for manufacturing cigar boxes. Weight, 36 lb. per foot cube. Crushing strength, 2·94 tons. Cedrela wood-oil is obtained from this tree, and the bark yields a gum resembling gum arabic, got by making incisions. It must not be confounded with the true cedars, which are cone-bearing trees inhabiting temperate regions. About 150,000 feet are annually exported from British Honduras, and the logs are 3 to 4 feet square.

94. WHISTLING PINE (*Casuarina equisetifolia*). Found in Jamaica, Trinidad, St. Lucia, etc. Also called Horsetail tree, from its likeness to a gigantic horsetail, and is a naturalised beefwood tree from Australia. In St. Lucia it is termed Filaro, which is probably the patois corruption for the French *filardeau*, a sapling—a reference that may be justified by the light appearance of the tree. The whistling pine is tall, straight, and slender, with a diameter of 12 to 18 inches, and growing to 60 or 80 feet high. It has the appearance of a fir, with small feathery branches, and from its sombre look it is sometimes planted in cemeteries. The wood is red colour, resembling beef, and is extremely hard, tough, durable, and adapted for scaffold posts and masts; being heavy it is valued for steam-engines, etc. Seems to coppice well, and is an important tree for fuel. The bark is astringent, and is useful in diarrhoea and dysentery.

95. WHITE CEDAR (*Myristica sp.*), from the Itooribisci creek, Essequibo river, and also from Trinidad, St. Lucia, etc.; is called Warikuri in British Guiana, and Poirier in St. Lucia. It grows plentifully in wet places, especially in the swamps up the Lamaha canal, leading into Georgetown, Demerara. The height is about 60 feet, with buttressed base, the diameter being 6 feet in the forest, but the ordinary section is 12 to 18 inches. The wood is white, has a pleasant smell, and is of pretty texture. It is hard, heavy, and close-grained, very durable under ground, but splits on exposure to the sun. It is well suited for piles, foundations, posts, jetties, and for any water work; and makes good yokes, boards, and shingles, and has proved to be especially suited for piles, as, if the portion between high and low water be protected, the wood will last in sea-water a long time; in this respect it is more durable than greenheart. The logs, however, are difficult to get quite straight. Piles can be had up to 40 feet long, and 10 inches diameter. Though white cedar lasts well in outside work or when wholly immersed in water, it will not withstand moist places, such as at the junction of the ground and air or between wind and water. Weight, 50 lb. per foot cube. The ashes of the bark are employed by the Caribs as a cure for dropsy.

96. WILD GUAVA, from the upper Essequibo river. The tree grows best in rocky soil, and there are four varieties. The wood is little known, but where a light, tough, and close-grained timber is desirable, wild guava should answer admirably. Its average height is 60 feet, and it will square 10 inches. The bark is a powerful astringent.

97. YACCA (*Podocarpus Coriaceous*). Found in Jamaica, on the Blue Mountains. The tree is about 50 feet high and 18 inches diameter, the wood being highly prized and ornamental, and much used in furniture and cabinet work. The planks are beautifully marked, and are employed in the interior finishings of dwelling-houses. Weight, 47 lb. per foot cube. Crushing strength, 2·55 tons per square inch.

98. YELLOW CIROUABALLI, or Sirua-balli, from the Arouapia-kooroo creek, Pomeroon river, British Guiana. The tree grows to a large size in loose sandy soil, but it is difficult to procure over 12 inches square free of sap; the average height is 60 feet. The wood is light, of a bright yellow colour, and strong aromatic scent, and is used principally for planking boats; when free of sap it is most durable. The bark is useful for tanning.

99. YELLOW SANDERS, or Yellow Wood (*Xanthoxylum clava Herculis*), is found in most of the islands. It is called Prickly Yellow in Jamaica, and Yellow Hereules in Grenada. There are two kinds, known by the colour of the bark—the black and the brown (this latter is sometimes mistakenly called white). The black has short prickles and thick dark leaves, while the brown has very pointed prickles and light green and yellow leaves. It might therefore be termed Prickly tree, the French appellation of L'Epineux, by which it is known in St. Lucia, signifying "thorny." The tree is about 50 feet high, and logs can be had a foot square. The wood is of a light yellow colour, of fine and even grain, and is employed for furniture, house work, fence posts, and almost every purpose. It is not considered durable for outside work. The wood with the black bark is superior. Weight, 52 lb. per foot cube. Crushing strength, 1·77 tons per square inch. The bark is considered a powerful stimulant and febrifuge; it is likewise used as a cure for rheumatism.

There is also another Yellow Sanders (*Bucida Capitata*), alternatively named Wild Olive, or Negresse. This tree is 30 to 60 feet high and up to 4 feet diameter, with roundish leaves. The wood is of a light yellow colour with satin graining, and is much prized in cabinet work, where it sets off dark woods. It saws freely, makes a beautiful board, and takes a high polish.

100. YOKE WOOD, Mast Wood, or French Oak (*Catalpa Longissima*), a native of Hayti, Jamaica, Trinidad, St. Thomas, etc. It is a tall, handsome tree, about 80 feet high, and 3 feet diameter, and is rarely found above an elevation of a thousand feet. The wood is light brownish-grey, with cross stripes of a darker colour, and somewhat resembles walnut. It is one of the most useful and best of timbers for boards and scantlings, very durable, and not too hard for general purposes. Weight, 70 lb. per foot cube. Crushing strength, 2·09 tons per square inch.

REFERENCES.—Specimens of West Indian woods were sent to the Colonial and Indian Exhibition of 1886, and were then permanently housed in the Imperial Institute, where they may now be seen. Lists of many Colonial woods appeared in the handbook of that Exhibition. A large catalogue with the names of 169 trees of Dominica, was compiled by the late Dr. John Inray of that Island, and appeared in the *Technologist* of June, 1862; the samples which accompanied it are now in the Kew Museum. This collection was sent to the great Exhibition of 1862, and obtained the award of a bronze medal. A good catalogue of 63 woods of British Guiana was likewise prepared by Mr. Michael McTurk for the Local and Paris International Exhibitions of 1878. A list of 75 trees of St. Lucia, with full descriptions and uses, was compiled by the present author as a portion of his book on "Building in St. Lucia," published in 1898.

The following references may be useful to those who would like additional information:—*Journal of the Institute of Jamaica* for July, 1896. Price 1s. The London agents are H. Sotheran and Co., 140 Strand, W.C. This issue of the foregoing journal gives a summary of tests of 22 specimens of Jamaican timbers sent to the Imperial Institute, with some useful remarks.

Economic Plants, being an Index to the Economic Products of the vegetable kingdom in Jamaica. By Wm. Fawcett, B.Sc., F.L.S., Director of Public Gardens, Jamaica. Published in 1891, from the Government Printing Establishment, 79 Duke-Street, Kingston, Jamaica. This pamphlet gives good and full descriptions of many Jamaican trees.

The Timbers of Jamaica, by Hon. W. B. Espeut. A paper published by the Institute of Jamaica, in 1881. Price, 6d. London agents, H. Sotheran and Co., 140, Strand.

Jamaica at the Royal Jubilee Exhibition, Liverpool, 1887. By C. Washington Eves. Spottiswoode and Co., London. A book with 91 pages.

Report on Forest Conservation for Trinidad, by J. H. Hart, F.L.S. May 1891. Waterlow and Sons, London.

The Colony of British Honduras, by D. Morris, M.A. E. Stanford, 55, Charing-cross, London.

Building in St. Lucia, by J. T. REA, F.S.I., M.R.I.A.I., Surveyor, War Department. Published in 1898 by R. Carruthers & Sons, Courier Office, Inverness. Price, 2s. 6d. Contains full descriptions and uses of 75 trees of St. Lucia.

Handbooks of the various West Indian Colonies, published locally.

Various other compilations on West Indian timbers have been made, but these are little known and not always easy to obtain.

PROCEEDINGS OF INSTITUTIONS.

THE ROYAL AGRICULTURAL SOCIETY OF ENGLAND.

The last monthly meeting of this society before the autumn recess was held on July 30, when COLONEL SIR NIGEL KINGSCOTE (senior trustee) presided in the unavoidable absence of the president, the PRINCE OF WALES. Mr. Roger C. Parr was elected a governor of the society, and 22 members were elected.

Mr. Bowen-Jones brought up from the Chemical and Woburn Committee three cases of adulteration which the committee desired should be published. The first case had reference to "cockles" or "corn cockle seed," which was not only a worthless material in a feeding sense, but also possessed distinctly injurious properties. The second case was one in which a member of the society had experienced loss through the admixture of castor oil bean in cotton cake. In the third case a material described as "linseed cake" and sold at £9. 10s. per ton was found to be grossly impure.

Mr. Wheeler reported that the Botanical and Zoological Committee recommended for the approval of the Council the following resolutions, adopted at a conference held on June 5 last between delegates of the Royal Agricultural Society and the Highland and Agricultural Society of Scotland, as to the testing of farm seeds:—(1) That there should be an uniform method of testing seeds and of reporting the results, the bases of such method to be those now in use by the consulting botanists of the two societies, subject to any modifications considered desirable by a small committee of experts; (2) that there should be one central testing station for Great Britain, which should be available not only for members of the two societies, but also for non-members, in the event of the Board of Agriculture approving and assisting in the establishment of the station; (3) that such station should be under the supervision of a joint board appointed by the Royal Agricultural Society of England and the Highland and Agricultural Society of Scotland. A letter had been received from the Highland and Agricultural Society stating that these resolutions had been approved by the directors at a meeting held in the showyard at Aberdeen, and that the Highland and Agricultural Society's delegates had been empowered to proceed with the further consideration of the matter in conjunction with the delegates of the Royal Agricultural Society. On the motion of Mr. Wheeler the resolutions adopted by the conference were formally approved, and the Society's four delegates were reappointed to confer with the delegates of the Highland and Agricultural Society as to the best means of giving effect to the resolutions adopted.

A report was received from the Society's zoologist, which stated that during the last month the wire worm had been more than usually prominent. Among the remedies recommended for the destruction of this pest were the trapping in the month of May of the click beetles, which were the parents of the wire worm, and the application of gas lime to infested fields.

Mr. Cecil Parker, on behalf of the Veterinary Committee, presented a report by Professor Macfadyen, which stated that for the 29 weeks of the current year 421 anthrax outbreaks, with 686 animals attacked, had been officially notified. These figures indicated a distinct increase in the frequency of outbreaks, the present year already showing an excess of 41 outbreaks over the number reported during the same period of last year and 96 over the outbreaks at the same date in 1900. During the first 29 weeks of the year 644 outbreaks of glanders had been reported, with 1,190 animals attacked, as against 738 outbreaks and 1,254 animals attacked in the corresponding period of last year. Twelve cases of rabies in the dog and 11 in other animals had been notified since the beginning of the year. No case had been detected in the dog since the month of May last. At the present date the officially reported outbreaks of swine fever for the year numbered 1,029, as against 2,385 at the same date last year. No fresh outbreak of foot-and-mouth disease had been detected since the end of March last, and there was therefore good reason to believe that the country is once more free from this disease.

It was arranged that the freedom of the Worshipful Company of Farriers should be conferred upon the first prize winners in classes 1 and 2 of the horse-shoeing competitions at the Carlisle meeting, and the committee considered it desirable that horse-shoeing competitions open to candidates in the United Kingdom should be held in connection with the society's show of 1903.

On the motion of Sir John Thorold (chairman of the Committee of Selection), seconded by Mr. Cecil Parker, it was resolved—(1) That authority be given for the society's seal to be affixed to the diploma of honorary membership of His Highness the Maharajah of Kolhapur, G.C.S.I., who was elected an honorary member at a special meeting of the Council at Carlisle, on the 9th inst.; (2) That the honorary membership of the society be conferred upon Señor Don Ramos Mexia, president of the Sociedad Rural Argentina, Buenos Ayres.

Mr. Cecil Parker presented a preliminary report from the special committee appointed on June 4 last to consider the arrangements to be made for the show of 1903. The committee thought it important that the Council should reassemble after the recess at an earlier date than usual to deal with various matters connected with the permanent show, and it was therefore decided that instead of adjourning as customary till November, there should be a meeting of the Council in October, when its recommendation should be considered. Meanwhile, the committee were unanimously of opinion that the show should be held at the usual date in the month of June, and that it should open on Tuesday, June 23, 1903, and close on the Saturday night of that week. Mr. Percy Crutchley, in moving that the show of 1903 be held on the Society's new permanent showyard in London, from June 23 to June 27, said that this meeting of the Council was the one in which it was customary to fix the date of next year's show. It was very important that they should fix the date now, in order that other societies might avoid making important fixtures at the same time; he thought that no one would advocate that the show should be later than the date proposed, and he did not think it would be prudent to fix any earlier date, having regard to the amount of work that remained to be accomplished. The motion was carried unanimously.

Mr. Frankish, on behalf of the Implement Committee, submitted the regulations for the trial of wind-pumping engines in connection with the meeting of 1903, when the first prize of £50 and the second prize of £20 would be offered for competition. Trials will take place at the permanent showyard in London on March 1, 1903, and would be continued at the discretion of the judges until April 30, 1903. The last date for the receipt of entries has been fixed for January 1, 1903.

The date for the next general meeting was fixed for December 11, 1902, and other business having been transacted, the Council adjourned over the autumn recess until Wednesday, October 8, 1902.

COMMERCIAL INTELLIGENCE DEPARTMENT.

REQUIREMENTS REGISTRY.

In order to provide correspondents with an opportunity of making known special "wants" or "needs" in the British Colonies, India, and Foreign Countries, space will be regularly devoted to the publication of approved notices in the IMPERIAL INSTITUTE JOURNAL. Notices, as a rule, should not exceed 25 words in length, for which a charge of 2s. 6d. will be made for each insertion. Special arrangements can be made for longer notices.

SPECIMENS OF FOREIGN AND COLONIAL WOODS desired. Purchase or exchange. Names and localities must be well authenticated. Address—HERBERT STONE, BRACEBRIDGE-STREET, BIRMINGHAM.

THE CURATOR OF THE CANADIAN SECTION OF THE IMPERIAL INSTITUTE is prepared to furnish information about Canadian Trade and to supply names of importers, manufacturers, shippers, etc.

The following trade enquiries have been received at the Canadian Section of the Imperial Institute, from the Curator of which Section further particulars may be obtained:—

Home Enquiries.—A Yorkshire firm desires the names of Canadian makers of fancy wheat preparations and similar foods.

Canadian Enquiries.—The manufacturers of a popular Canadian bicycle wish to be placed in communication with United Kingdom importers who are prepared to introduce their machines to this market.

A Canadian firm about to commence the manufacture of maple rollers and other wooden goods asks to be placed in communication with importers of same.

TRADE OF INDIA IN 1901-02.

In his excellent *Review of the Trade of India in 1901-02*, Mr. J. E. O'Connor gives the following general summary. He says that the shadow of famine hung darkly over the land in the first half of 1900-01, but lifted in the second half of the year, with the return of an ordinary monsoon followed by winter rains which, on the whole, favoured the growth of the great staples of Indian trade. Still, the commercial and industrial features of the year bore eloquent testimony to the extent of the disaster which had supervened on the failure of the monsoon and the destruction of the crops in 1899. The traces of the calamity were, however, in great measure effaced last year, and the return of fairly good conditions for the pursuit of agricultural operations, which constitute the greatest industry of the country, was accompanied by the reversion of imports and exports to normal conditions and by a great increase in their dimensions. The imports of merchandise increased in value by 519 lakhs of rupees (£3,460,000), much of the increase indicating the restoration to the people of purchasing and consuming capacity and the resumption of industrial operations after the period of depression had passed away. Cotton goods and yarn increased by about 306 lakhs (£2,040,000), and there was a marked revival of activity in the imports of machinery and mill work, metals, mineral oils, railway material, coal, chemicals and dyes. There was also an appreciable development in the importation of various other articles, some of greater, others of less importance, such as tobacco, salt, sugar, precious stones and pearls, apparel, carriages (which include bicycle and motor cars), glassware, matches, paints, and colours, paper. The only really significant reduction is limited to food grains, and of these it may be said that, as they are not needed in India in an ordinary season, their large importation is a symptom of the existence of abnormal conditions, and the disappearance of the trade may be regarded with satisfaction.

While the imports increased the exports which paid for them also increased, and the increase was in greater proportion, owing to the additions made to the sum annually drawn in Council bills. The exports of Indian merchandise increased by 1,704 lakhs (£11,362,000), the increase being at the rate of 16 per cent. Most of the improvement may be assigned to the agricultural products which are such dominating factors in the export trade. The return of a good season, with good harvests, led to a trade greatly in excess of that of the preceding year in rice, wheat, oilskins, cotton, and jute. The ability to supply these articles to the consuming markets found these markets ready to take them at profitable prices, and the year was, on the whole, of advantage to the exporter as well as for the producer.

The improvement in agricultural conditions which enabled the producer to put on the market large supplies of the articles just mentioned, was accompanied by other conditions favouring and encouraging the export trade. Money continued in good supply throughout the year, the Bank of Bengal rate not having reached 8 per cent. until the 12th February, dropping again to 7 per cent. by the 27th March. This was the third consecutive year in which the maximum did not rise above 8 per cent. The minimum rate of 3 per cent. in July and August lasted for a little over a month. The course of exchange was perfectly steady throughout the year, ranging quietly from 1s. 3½d. to 1s. 4½d., and it may be said now that, after the experience of the last four years, importers and exporters alike have ceased to concern themselves about the course of exchange or to insure themselves against its fluctuations, the violent shocks which from time to time jerked and dislocated trade being confidently considered things of the past. It may be noticed that, while the rupee has as steadily maintained the value assigned to it as the silver coin of France, the changes in the price of the silver have been as sudden and violent as in any former years, while its downward course has been unprecedented in swiftness and depth. The highest price of silver in the year was 27d. an ounce, the lowest was 24d., a difference of 12½ per cent. As things stand, the vicissitudes of silver left the Indian market untouched, and their only effect was to qualify in some measure the restoration to normal conditions of our trade with China by the introduction of an element of uncertainty giving rise to speculative operations. Nevertheless the close of the period of the disturbance in China and the gradual easing off of an overloaded market, combined with a fall in the price of cotton and a recovery in the value of yarn, brought renewed vitality to the Indian spinners of yarn for China, while spinners for the Indian market also found that the consuming capacity of the weaver, which had been seriously affected by famine, had been restored. The outcome of these more auspicious conditions was a resumption of activity in the Indian cotton industry and a very large increase in production and export.

The jute mills of Bengal also prospered as well as the cotton mills of other parts of India, and large sales of gunny bags and cloths were made, at profitable prices, for the local market and for export, at the same time there was an active export of the raw material. On the whole, the principal features of the export trade of the year were the renewal of activity in the shipments of food-grains and oilseeds, due to a good season and to favouring conditions of the market, and a large export of cotton and jute and of the manufactures of the cotton and jute mills.

While the return of agricultural prosperity was indicated on the one hand by an increased volume of trade in the articles mentioned, it was also indicated, on the other hand, by the return of the trade in hides and skins from the unprecedented dimensions attained in 1900-01 to ordinary proportions, this decline being as satisfactory in its way as the increase in the other articles mentioned. But it must not be assumed that the conditions of the trade were in all respects entirely satisfactory. In some important items, indeed, the restriction of exports indicated the continuance of depression which has caused anxiety to all interested in the progress of some of our large industries. The shipments of tea declined materially,

more in value, by reason of a continued low level of prices, than in quality, although in this also the decline was substantial. The reduction in quantity was partly due to voluntary restriction of output, but perhaps even more to climatic causes. Indigo also was exported on a reduced scale, as a consequence of an indifferent crop and partly of the contraction of cultivation under the discouragement of low prices. Nor was the reduction of exports followed by any material elevation of the low level of prices which was established when the synthetic indigo entered the market as an active competitor with natural indigo. The outlook for indigo planters does not seem more favourable than it did a year ago, but it is now recognised by them that their business has moved from the basis on which it stood in the days before dyes began to put into their vats dyes made in a chemical laboratory, and the recognition of the fact is the first step to the readjustments which the new conditions compel.

Opium was the only article of prominence in the trade in which there was not an important decline. This was due to a material contraction in the quantity of Malwa opium exported from Bombay, in consequence of the failure of the crop in the famine year in the States of Central India, where this description of opium is grown for export.

There was a heavy fall in lac, but the export of this article in the two preceding years was excessive, and the market is variable and fluctuating.

In 1900-01, the export trade of Bombay and Sind was reduced to a low level; but last year the restoration of ordinary conditions was attested by the prompt increase of exports from Bombay and from Karachi. Into both ports also imports were actively brought, with too much activity indeed into Bombay, where the speculative enterprise of dealers was somewhat discouraged by the unexpected slowness of recuperation in the districts which had been so sorely smitten by famine.

THE GAMBIA IN 1901.

In the annual report of the Colony of the Gambia for 1901, it is stated that the total value of the imports for the year amounted to £252,646, as compared with £277,659 in 1900, a decrease of £25,013, which was mainly under cotton goods, and due to smaller importations, owing to the mercantile houses having large stocks on hand from the previous year; and to the failure of the ground nut crop, which considerably reduced the purchasing power of the natives. Kola nuts shared with cotton goods the cause of the falling of in the value of the imports, for whereas the value of kola nuts imported in 1900 amounted to £39,937, the quantity imported in 1901 exceeded that imported during 1900 by 19,423 lb., but was only valued at £21,008, a decrease on the value of 1900 of £18,929. There was a considerable increase in the importations of rice, owing to the destruction of the local crops by locusts.

The total value of the exports for the year amounted to £233,667, as compared with £281,976 in the previous year. This decrease was almost entirely brought about by the failure of the ground nut crop due to the failure of the rains. The crop yielded about 10,000 tons, of the value of about £50,000, less than it did in the preceding year.

There are no mines in the colony. In view of the recent development of the gold mining industry on the Gold Coast, it may be worth recording that a few years ago an individual in Government employ took samples of rock from one of the districts in this colony to England. He afterwards reported that on examination the samples in question showed a richness of gold equal to the best mines in South Africa, and immediately endeavoured to float a company.

With a view to ascertaining what truth there was in the statement the Government sent home supplies of rock from the same district, with the result that the assay showed them to contain 2 dwts. of gold to the ton. It is hardly necessary to say that the Gambia Goldfields Corporation has not yet come before the public.

The only manufactures in the colony are a small quantity of native pottery and narrow strips of cloth called "Bandy-cloths" which, when sewed together are called "pagns," and make handsome cloths much prized by the natives. A considerable number of people at Bathurst and on the seacoast both northwards and to the south are engaged in fishing. Large quantities are caught, and what is not immediately consumed is dried and taken up the river in the dry season and exchanged for corn, rice, etc. The cultivation of ground nuts is the principal industry throughout the colony. Large crops of cassada, maize and rice, are also grown, but not in sufficient quantities to supply the wants of the people all the year round. The local grown rice is much preferred by the natives, and if put on the market it is believed that it would command a much higher price than the Rangoon rice, large quantities of which are annually imported, but, as in many other respects in this colony, the question of labour is the great difficulty. The following figures give the importations of rice for the last five years:—

1897.	1898.	1899.	1900.	1901.
Cwt.	Cwt.	Cwt.	Cwt.	Cwt.
29,426	80,956	35,900	53,649	86,986

Sweet potatoes are grown to a limited extent, and when in season large quantities of oranges and limes can be obtained. The former, grown in the Kombo district, about eight miles from Bathurst, are well known for their excellence. A point not without interest in a place like the Gambia is that there is hardly a European resident, who, if he has a garden attached to his house, does not grow English vegetables sufficient to supply himself and his less fortunate friends for at least six months of the year, viz., from November to April. With ordinary care, cabbage, carrots, turnips, kohl rabi, lettuce, beetroot, French beans, cress and radishes can be grown most successfully; indeed some of the French residents, who have the best gardens, are sufficiently enterprising to grow cauliflowers and celery.

A botanic station was established in 1894, but it cannot be said to have been successful in the development of minor industries. It is extremely doubtful whether the site selected was a suitable one, and it is in contemplation to remove it at an early date to a more favourable locality. The present station has, however, assisted in the distribution of many orange and lime trees, and suckers of the Canary banana; but without a supervising eye it has been difficult to get the natives to give the necessary attention to the young orange and lime trees, so that the majority of them have died during their first dry season.

VANILLA CULTIVATION IN THE SEYCHELLES.

The following memorandum, containing information on the subject of vanilla cultivation in the Seychelles, and on other points, has been officially issued by the Hon. E. B. Sweet-Escott, C.M.G., Administrator of the Seychelles:—

No vanilla plantation should be started in Seychelles with a capital of less than £1,000, seeing that it takes three years to bring in a crop. Land suitable for vanilla, cacao, coffee, and other tropical products cannot be secured for much under Rs. 300 per acre, and, even at this price, it is not easily obtainable. The ordinary rate of interest in Seychelles is 12 per cent. per annum. The local currency is the rupee, the value of which may be taken as 1s. 4d.

Under the old system (planting on bars, wires, etc.) from 1,200 to 1,300 vines were planted per acre. Vanilla is now planted on live trees, and the number of vines planted depends upon the number of trees existing on the land brought under cultivation. Cuttings of quick-growing shrubs are now often planted in vacant spots, and vines are grown thereon in the absence of trees, and within three months of the planting of the cuttings. Vines are planted

6 feet long, and begin to bear three years after planting, but will only come into full bearing in three years more. Vines are worth, per 100, from Rs. 3 to Rs. 5 according to district. Wages: men Rs. 14 to Rs. 16, and women Rs. 8 to Rs. 12 a month, without rations. On hill estates, labourers are not easy to get, and most of the Africans prefer working on the share system.

A man can plant 350 cuttings or vines per day, and can keep in good order, throughout the year, 2,500 plants. Women are employed for marrying the flowers, i.e., removing the pollen from the anther of the flower and applying it to the stigma (fertilisation), without which operation the flower is lost. A woman can marry from 600 to 800 flowers per day. No flowers can be married after midday. Each vine can produce from 25 to 30 pods of different size from 4 inch to 8 inch long. On an average, 130 green pods go to 1 lb. of dry (prepared) vanilla. Pods shrink considerably in preparation, losing a quarter of their weight. Local prices: Last year (1901) fine pods prepared fetched Rs. 6 to Rs. 10 per lb. Green pods are now being sold at Rs. 3 to Rs. 5 per 100 pods. The regular flowering season is from August to December. The cost of preparation varies from R. 1 to R. 1.25 per pound. The pods are gathered about nine months after the flowers have been married, and curing the pods takes from three to four months. In Seychelles, as elsewhere, there are bad seasons, (too much rain), in which case the yield is poor.

The climate of Seychelles is very healthy. The population on the 31st May, 1901, was 19,257. The death rate in 1901 was 18.77 per 1,000. The Seychelles are in direct steam communication with Aden and Mauritius by a monthly service of steamers of the Messageries Maritimes Company, and with Colombo and Mombasa by a bi-monthly service of steamers of the Imperial German East Africa Company. Steamers belonging to the British India Company call, from time to time, at Seychelles.

The Eastern Telegraph Company has a station at Victoria.

The rainfall in 1901 in Victoria was 101.83 inches. The maximum shade temperature registered was 88.5, and the minimum 68.4; the mean for the year being 78.50.

Total revenue for 1901	Rs. 486,323.98
„ expenditure „	Rs. 401,821.57
„ surplus „	Rs. 84,502.41
Declared value of exports, 1901	Rs. 1,417,515.19
„ „ imports „	Rs. 1,149,646.21

Hotels: Only one, small and uncomfortable.

No cyclones.

Principal merchants: Affoi and Co.; Boustead, Sons, and Co.; Baly, Bergne, and Co.; D'Emmerez and Co.; E. Lanier and Co.; Said and Co.; L. Deltel, Son, and Co.; P. Mervanji and Co.; Temooljee and Co.; K. C. Chetty and Co.; and K. S. K. Naiken and Co.

THE ST. LOUIS INTERNATIONAL EXHIBITION OF 1904.

This Exhibition was originally planned to open on May 1, 1903, but it has been decided to postpone it for a year. Some idea of the magnitude of the Exhibition may be obtained from the fact that 1,400 acres of ground have been appropriated for its accommodation. Intimation has been received that the Foreign Office has recently signified the acceptance by H.M. Government of the invitation of the Government of the United States to take part in it. The exhibits to be made by H.M. Government in its official capacity will be limited to Education and the Fine Arts.

In connection with the above, a communication has been received from Mr. George F. Parker, the Resident Representative in this country of the Exhibition, which states as follows:—

"France was the first European country to accept the invitation of the United States. This was only natural, as the Exhibition celebrates the centennial of the purchase, by the United States from Napoleon, of the great territory of Louisiana. France has made a grant of 600,000 frs. (£24,000), for preliminary organization and the expenses of a commission, which has already visited St. Louis. It is announced that a special building—the site for which has already been selected—will be erected upon the exhibition grounds, the Petit Trianon having been chosen for reproduction. Largely increased grants will be made later, so that the participation of the French Government and people is likely to be a conspicuous feature. The space already bespoken is 40,000 square metres for exhibits and 5,000 square metres for a pavilion."

"Japan has appointed a Royal Commission and has set aside the sum of 2,500,000 yen (£250,000) for the erection of a building and for making an exhibit which shall be complete throughout the whole line of its industries, devoting special attention, however, to artistic products. This Commission will be composed of some of its leading statesmen, and perhaps headed by the Emperor or some member of his family. Canada has made a preliminary grant of \$125,000 (£25,000), has selected the site for its building, and will make very elaborate exhibits in agriculture and forestry, as well as in its manufactures, railways, and mining, besides devoting special attention to its fisheries. Italy will give its official attention to a show of fine and applied arts, including glass and mosaics, which promises, if the plans are carried out, to be more complete than any it has made in any previous exhibition. Mexico and several of the republics and countries of South America, which last year displayed fine exhibits at the Pan-American Exhibition at Buffalo, have already accepted the invitation, and will make a strong show of the products peculiar to their soil and climate. In addition to the formal acceptances, the Emperor of China has sent a Commission to St. Louis, apparently for the purpose of concluding upon the most direct form in which the Empire may undertake a display. The German Emperor has been consulted in regard to the Universal Exhibition, and it is apparent that the desire is that the nation shall be fully represented, both in regard to trade and education, and also in the fine and applied arts section. Further, among the older, but now progressive, nations, Korea has notified its intention to be represented officially. The Imperial Government at Constantinople has decided to participate and to send a Commission to the Exhibition, and is encouraging the merchants and manufacturers to become exhibitors. And a movement in Russia is in progress to attain the same ends. To add to the before-mentioned, several other countries of Europe and Asia have signified their intention to be represented with Commissions or with official exhibits of some kind. In fact, the probability is that before the end of 1902, while still about a year and a quarter of time will remain for perfecting arrangements, practically every important country in the world will have accepted the invitation to take part."

The Foreign Markets for British Coal.—The *Coal Merchant and Shipper* says:—During the past six months the relative importance of our foreign customers has not shown much change. Taking them individually, we find that France remains at the head of the list with 3,561,329 tons, a considerable falling off as compared with the same period last year; Italy comes next with 3,035,004 tons, as against 2,687,463 tons in the first half of last year; Germany, which remains the third in importance of our over-sea customers, took 2,611,246 tons, the figures for last year being 2,681,199 tons; Russia, 893,200 tons, as against 992,653 tons; Sweden and Norway, 1,134,525 and 673,806 respectively; and Denmark, 937,719 tons. Egypt imported less British coal, and among other countries whose wants we are supplying on a decreased scale we may mention Gibraltar and Holland, while Portugal, the Azores, and Madeira, our own possessions in the East Indies, are somewhat better customers than at this time last year. Brazil and the buyers grouped together under the head of "other countries" are importing more coal from Great Britain.

NEW BOOKS, etc.

THE CANADIAN GOVERNMENT PRINTING BUREAU. (Ottawa, 1902.)

The Statistical Year-Book of Canada for 1901. Seventeenth year of issue. Issued by the Department of Agriculture. Compiled in the Statistics Division. Cr. 8vo., pp. 678.

This valuable Year-Book contains an immense mass of statistical and other information, concisely arranged, respecting the dominion of Canada, and is an admirable record of the great progress made in almost every department during the past year. It is a model compilation, and, being derived from official sources, is most authentic and trustworthy. A glance at its contents will serve to show the immense development of the country. Its population, according to the census of 1901, was 5,371,051, an increase of nearly nineteen per cent. in twenty years. As regards agriculture, Manitoba and the North-West Territories have become one of the largest wheat-growing centres of the world, a fact of immense importance to the mother-country, Canada being now termed Britain's granary. The mineral production in 1901 was valued at \$69,407,000, of which amount gold contributed \$24,462,000; the Klondike has proved to be remarkably rich in the precious metal. The fisheries have been as valuable as in the previous year. Perhaps the greatest increase is shown in the trade and commerce of the Dominion, the total imports and exports during 1901 being valued at \$386,903,000, almost double the amount in 1885. A striking proof of the flourishing condition of the country is shown by the Savings Banks, in which on 30th June, 1901, the deposits amounted to \$56,046,957. As a work of reference on Canadian questions, the Year-Book will be found most reliable and convenient; the statistical tables possess the merit of being well set out and are clearly printed.

SAMPSON LOW, MARSTON AND CO., LTD. (London, 1902.)

The Bond of Empire. By M. G. JESSETT, F.R.G.S. 8vo., pp. xvi + 272.

This volume deals with Imperial Federation and Imperial Trade and Defence, and is made up largely of quotations from many authorities who have written or spoken on the subject. In the introduction, the author says that we now not only recognise the vast importance of our Colonies, but begin to realise that reciprocity can alone render the relationship indissoluble; that the policy of give and take must be mutual. He strongly advocates the direct representation of the colonies in an Imperial Parliament, and considers that, as regards an Imperial Council, there can be no doubt that the colonies are anxious to be represented in such a council. With regard to Imperial Defence, Mr. Jessett says that the colonies are morally bound to appropriate a certain percentage of their revenues towards the cost of the navy. His views with regard to state-assisted emigration do not appear likely to be adopted, even though a new Cabinet Minister of Emigration were created. With regard to protection, he takes the popular view of the question, and concludes that the advantage of a Customs Union is obvious, though this is by no means such an easy problem to solve. He strongly urges the importance of Chambers of Commerce in the struggle for commercial supremacy, and the appointment of colonial commercial agents. The book contains much that is interesting, and is a useful contribution to the literature of the subject. It is well printed, and illustrated with photographs of statesmen whose ideas and opinions on Imperial questions are largely cited in its pages.

India and Imperial Federation. (Published 1889-1900). With original articles, letters, and press comments since the first edition was published. Second Edition, revised and enlarged. 8vo., pp. 180. (Price, paper cover, 1s.)

This little book consists of a number of articles, letters, and press notices relating to the question of "Imperial Federation," and showing the growth of Federal principles in India from their first inception by Lord Beaconsfield more than 25 years ago. The most important of these articles are those written by the editor, Mr. McLAREN MORRISON, which appeared in the *Calcutta Englishman* in 1900. Mr. Morrison has been a strong advocate for Imperial ideas, and has largely aided in promoting loyalty to the Empire in India. In a pamphlet written in 1889 he said:—"Imperial Federation properly applied to India will open up careers for the native princes, their followers, and all the warlike population of this great land, will bind our fellow-subjects to us in a way that nothing else can, and secure for us the lasting friendship of the independent nations around us." He strongly urged the formation of an "army of Imperial Federation," as the almost certain result of co-operation of Imperial and Colonial troops in South Africa would afford an opportunity of which the independent, as well as the feudal, native princes of India would hasten to avail themselves if it were offered them." The loyalty of the native princes has now been placed beyond all doubt, and the offer of assistance during the late war is a striking proof of their attachment to the British Empire.

THE BRITISH AUSTRALASIAN CONSOLIDATED PUBLISHING COMPANY, LTD. (London.)

The Year-Book of Australia for 1902. Twenty-first year of publication. Published under the auspices of the Governments of the Commonwealth of Australia. 8vo., pp. lviii + 832. (Price, 10s. 6d.)

This may be regarded as a Government publication, the information it contains being derived from official sources. It gives an admirable review of the progress and condition of the six States forming the Commonwealth, with regard to art, science, and industries. The financial and banking statistics will be found most useful, and also the census results for 1891-1901. Reviews of land operations, and the land laws are given, and a mineral review of the past year. Section VI. contains postal and telegraphic information, and this is followed by reviews of the railway operations and progress in the Commonwealth. Sporting has a section to itself, and full particulars will be found with regard to the administration and legislature, religious persuasions, education, law department, medical, military, naval, and commercial information. The book is a most reliable work of reference on questions relating to the Australian Commonwealth; and with the accomplishment of Australian federation, it will become still more valuable as a record of the development and increasing wealth of the country. With a federal tariff and federal laws, this progress is now doubly assured.

A. M. AND J. FERGUSON. (Colombo, Ceylon, 1902.)

The Ceylon Handbook and Directory, and Compendium of Useful Information; to which is prefixed a Statistical Summary for the Colony, and especially for the Planting Enterprise; up to June, 1902. Compiled and edited by J. Ferguson, Editor of *The Ceylon Observer, Tropical Agriculturist*, etc. 8vo., pp. lxi + 1177. (Price 10s.)

This is an *ad interim* edition of *The Ceylon Handbook and Directory*, a most useful and compendious volume. It supplies all the purposes of a commercial and planting directory with even more fulness than its predecessor, several improvements having been introduced. Additional information is given in reference to the tea and cacao plantations, minor products, etc. New features are a full list of "Charitable and Literary Institutions of Ceylon," and a list of Civil Servants, arranged according to classes. The Road List is still incomplete, as the publication of a road itinerary by the Public Works Department is waited for. The detailed results of the recent Census will be found very useful and interesting. The usual agricultural and planting review has been omitted from this edition, as it is not considered necessary to supply this every year, but the chief statistics of the industry are given. A very clear and useful plan of the Colombo Harbour Works, now in progress, is placed as a frontispiece to the present volume. This plan presents an excellent idea of the magnitude and utility of an undertaking which will make Colombo one of the finest harbours in Eastern waters. A word of praise is due to the careful compilation of this valuable handbook, which has become indispensable to all having business connections with the island.

STEVENS AND SONS, LIMITED (London, 1902.)

Handbook of Patent Law of All Countries. By W. P. THOMPSON, F.C.S., M.I.M.E., etc., Head of the International Patent Office, Liverpool; Chartered Patent Agent, and Certified United States Patent Attorney. Twelfth Edition, completely revised, 1902. Sm. 8vo., pp. viii. + 207. This useful handbook has been carefully and thoroughly revised so as to be brought up to date. Its aim is to serve as a useful guide to patentees, manufacturers, and investors in patents. It is also written with a view of answering the numerous enquiries as to cost and law of patenting which the author's firm, W. P. Thompson and Co., receives daily in the course of its business. As in former editions, the fees for procuring Patents at home and abroad

are inserted. These are only approximate, being the average charges usually made in the profession, and may be relied upon as fair rates for Patents of ordinary type. Besides the numerous alterations entailed by the passing of new laws in the various countries, considerable matter has been inserted in this edition, and the longer chapters in the foreign section have been arranged with convenient index headings. The book is compactly arranged, and of a handy size for reference. It will be of genuine assistance to inventors, manufacturers, and those interested in patents generally.

THE MOORGATE PUBLISHING CO., LIMITED, have issued the 1902 edition of the *West African Year-Book*, a bulky volume of 560 pages, which contains a vast amount of interesting and useful information on every conceivable subject connected with West Africa. Practically, half the book is devoted to a directory of the companies connected with West African mining. It is a remarkable fact that, despite the apparently waning interest in Jungles during recent months, the aggregate nominal capital of West African companies, after allowing for defunct enterprises—is £45,492,497, as against £39,660,495 in September, 1901. There are now 501 West African companies in existence. The number of individual directors is 834, and there are 225 secretaries. All these companies are dealt with in the directory. Both the 1901 editions of the Year-Book have been out of print for some time. The work is admirably printed on good paper, and its price is 10s. 6d. net. The publishers' address is Finsbury Pavement House, E.C.

Russia is the title of a new sixpenny illustrated weekly to be published by Mr. Andrew Melrose, designed to develop commercial relations between Russia and Great Britain, and by articles on Russian literature, drama, and arts to make the people of the two countries better acquainted. The editor is Mr. Nicolas Notovitch, whose brother is the proprietor of the well-known Russian paper *Novosti* in St. Petersburg.

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- The Institute will undertake the supply, at cost price, of translations, into any language, of trade circulars, prices-current, etc., the conversion of weights, measures coinages, etc.

Transvaal Trade.—The British Trade Commissioners, Messrs. Morgan and Jenkins, now at Johannesburg, state that large orders will shortly be going for electrical and mining plant in Johannesburg. The merchants wish to give British manufacturers preference, but British prices generally must be considerably reduced. Owing to excessive freights, the machinery must be made lighter, and quicker deliveries must be effected in order to enable British firms to meet American and German competition. The largest electrical tramway system in the world will shortly be laid down here, and merchants are emphatic in stating that it is only by attention to the above points that they can hope to secure for British manufacturers a fair share of the orders. American and German houses have been very active, and recently booked several orders at remarkably low prices in order to secure a firm footing in this market. English machinery is preferred, but prices and weights must be reduced.

MONTHLY COMMERCIAL AND INDUSTRIAL SUMMARIES.

GENERAL COMMERCE AND INDUSTRY.

UNITED KINGDOM.

British and German Locomotives in India.—The question of the relative merits and cheapness of English and foreign locomotives is the subject of a Parliamentary paper dealing with the correspondence which has passed between the Under-Secretary of State for India and certain firms of locomotive builders in this country. It appears that the India Office has recently given out to British firms some contracts for engines for the State railways in India, and to these firms the India Office wrote, when accepting the tenders, a letter which threatened the probability of future orders being given to Germany.

Lord George Hamilton stated that he had received "from a firm of German manufacturers of the highest standing" tenders which were more than 20 per cent. in the case of passenger engines, and nearly 20 per cent. in the case of goods engines, below the quotations of the eventually successful English firms. Moreover, the date of delivery was, in respect to the passenger engines, twenty-five weeks earlier, and in the case of the goods engines thirteen weeks earlier. Now, remarks Lord George Hamilton, if it should be shown by experience that the German manufacturers are able and willing to turn out work which, though possibly inferior in respect of finish, is for practical purposes equal or nearly equal to that which is produced in this country, at prices materially lower, and with the further advantage of much earlier delivery, it is obvious that, in justice to the interests of India, he will be compelled to accept foreign tenders, and, possibly, to accept them on a large scale.

The English firms in question—Messrs. Dübs and Co., Messrs. Nelson, Reid and Co., and Messrs. Nasmyth, Wilson and Co.—reply in detail to Lord George Hamilton's challenge. With regard to the twenty per cent. difference in cost, Messrs. Dübs and Co.'s main contention is that, although in the late competition British and German manufacturers tendered upon the same specifications and drawings, they placed very different interpretations upon these documents, and naturally framed their estimates upon their interpretations. The British firms estimated to use the very best materials obtainable, and to put upon the locomotives a class of workmanship and finish which admittedly has not been reached by any foreign locomotive builders, whereas the German firms estimated to use much cheaper materials, and their standards of workmanship and finish were much below those of their British competitors. In a word, the Germans, it is contended, were offering a cheaper kind of thing altogether, notwithstanding the specifications with which they were supposed to comply. As to the difference in time of delivery, Messrs. Dübs and Co. pertinently recall to the India Office's notice a letter to the press last December, in which the chairman of the East Indian Railway claimed that his Board, by accepting a German tender for 40 locomotives, had saved the shareholders not only large sums in the purchase cost, but thirty-nine weeks in their delivery. The German firm had undertaken to complete the work in forty-six weeks; but, write Messrs. Dübs and Co., "about forty-one of those weeks have now expired, and not one engine has yet been shipped, the delay having, we understand, been caused by the wholesale rejection of materials."

COLONIES.

Beet Sugar Cultivation in Ontario.—The Ontario Department of Agriculture has arranged for extensive experiments in sugar-beet-raising. These will be conducted at St. Catharines, Brussels, and Markham, and perhaps at Renfrew, Orangeville, and Guelph as well. About thirty farmers will raise beets at each point. This is the third successive year of sugar-beet experiments in Ontario. The results have been very satisfactory, and an effort is being made to ascertain if the soil is generally adapted for beet-raising. It is reported that the Ontario Beet-Sugar Company, with headquarters at Berlin, is taking an original way of securing acreage. The company is working in North Dumfries, particularly in the Dickie settlement. The farmer prepares the ground for the seed, but the company does the planting and all the rest of the work, including the thinning, cultivating, lifting, etc. For the use of the land, \$10 an acre is paid. A good many contracts have been made; in some cases, for two or three years.

British Central Africa Protectorate.—The report of Mr. Sharpe, the Commissioner of the British Central Africa Protectorate, for the official year 1901-2, has just been published. The description given of the condition of the Protectorate is, on the whole, very satisfactory. There was, indeed, a decrease in the production of coffee, which is the main product; but there is every prospect of the current year's proving an exceptionally good one for the planters, who have imported fresh and carefully selected seed from Jamaica. Tobacco has increased; it finds a ready market in Rhodesia, and there is reason to believe that, with suitable cultivation and curing, the leaf would find acceptance at home. The soil and climate are both adapted to the growth of tobacco, labour is cheap compared with other tobacco-growing countries, and the cost of transport to the coast has lately been greatly reduced. The export of rubber has decreased, for the area producing it is small and has soon been exhausted; the bulk of the rubber now leaving the Protectorate for Chinde, the port of export, passes through in transit from the territories to the north and west. The total imports, excluding specie, amounted to £126,592 last year, while the exports were only £21,739, both showing a decline on the previous year. The goods in transit amounted to about £51,000. As usual, about five-sixths of the total trade passed through Chiro. Chinde is served by fortnightly steamers of the German East Africa Line from Hamburg, and by a monthly (which is sometimes a fortnightly) steamer of Messrs. Rennie's, from London via Durban. In referring to Lake Nyasa, the levels of which are carefully taken at certain points, Mr. Sharpe mentions that there is a very clear and definite water-mark which can be seen on the rocks all round the lake from north to south, and is 11 ft. 7 in. above the present level. This would show that at some previous period, before Europeans had settled in that part of Africa, there was a great subsidence in the lake. The cultivation of rice has increased, mainly on the shores of the lake, and there is a considerable market for it both in Zomba, where there are now two battalions of native troops, and also in the Shiré Highlands, where the planters find rice the best food to give their labourers. Skilled and unskilled labour is becoming more plentiful. Great improvements have been made on the main road from the Shiré river to the Upper Shiré, the gradients have been made easier, surfaces have been levelled, drains have been added as well as numerous culverts, and the less difficult part of the road has been so improved that it can be used by traction engines. The various transport companies are making efforts to replace native carriers by ox-wagons and donkeys.

New game regulations, in accordance with the decisions of the International Conference of 1900, have been introduced. Game is not on the decrease, except perhaps in the immediate neighbourhood of the European settlements. There are large herds of elephants in Angoniland—Mr. Sharpe recently saw one herd there which numbered over 100—where they do much damage to the grain plantations. When on these robbing expeditions the animals go in large bands, and the Angoni say that the tuskless bulls and cows always go first and act as scouts, the main body following. There were no military expeditions during the year, and the country was quite peaceful. Fort Maguire on the east side of Lake Nyasa has been abandoned as a military post, for the raids, which it was established to check, have wholly ceased. Military service has become very popular with the natives, on account of the good pay, and the favourable reports of soldiers returned from Mauritius, Somaliland, and other places. The mortality amongst Europeans has been below the average; but small-pox has been prevalent in some districts, and the deaths amongst the natives have been numerous. Vast numbers of the people have been vaccinated by the Administration and mission medical officers. The growth of wheat and the production of flour have been taken up during the past year on a considerable scale; a large area near Blantyre is under wheat; milling machinery has been imported, and flour of excellent quality has been produced. The Europeans and Sikhs readily buy the flour. Stock-raising is likely to become an important industry in Angoniland, as the markets of Salisbury and Bulawayo are comparatively near.

British Guiana.—The position of the gold, diamond and forest industries of British Guiana for the year ending June 30 last, has been reported on by the council of the Institute of Mines and Forests. The gold industry has been marking time, but apparently this is not for the lack of the precious metal, for the report declares that "although it is perfectly true that the richer parts of the regions already prospected no longer offer large profits to unskilled workers and wasteful methods of working, it is equally true that up to this we have barely scratched the surface of the gold-bearing deposits of the colony." Lack of capital and initiative are said to have been responsible for the almost entire cessation of properly-conducted prospecting, and those now engaged in the industry have settled down to take out the gold at something like half the cost per ounce that was expended, and largely wasted, ten years ago. There are not, however, wanting signs that the next twelve months will see a large increase in the gold export, a very large amount having been spent on hydraulic works. As regards diamonds, 132,077 were declared at the Department of Mines during the year under review, and an encouraging sign has been the discovery lately of stones larger than the ordinary run. The greatest present drawback to the industry is the difficulty and danger of reaching the diamond district.

New South Wales Mineral Production.—The value of the State's mineral products last year amounted to £6,006,635, being a decrease of £564,183 on the total of the preceding year. An increase of £617,341 was contributed by coal, shale, opal, lime, iron and bismuth. The decreases amounted to £1,181,524, silver, lead, and zinc showing a shortage of £828,429, owing to reduced market values; while gold decreased £273,239 and copper £14,734. The fall in values has stimulated the exercise of economy in the working. It is officially declared that never previously have the mines been in a better position as regards large outputs.

New Zealand.—AGRICULTURAL RETURNS.—Revised returns have now been published by the Agricultural Department of the season's yield of the principal classes of grain. The report states that it has been exceedingly difficult to obtain an accurate return of the yields this year, the weather having for some months been of an exceptional nature. In the early summer very dry weather over a large portion of the colony stunted the growth of crops to such an extent that when the estimated yields were declared in January last, it was deemed advisable to deduct 9,000 acres from area of wheat, oats, and barley for thrashing purposes. The long period of dry weather was followed by heavy rains, in consequence of which much of the wheat sprouted and was rendered unfit for milling. The oats and barley are sound, but much of the grain will be discoloured. The revised estimates of the yield show an increase of about 9 per cent. on the average of oats, and 15 per cent. in that of barley, but a decrease of about 1 per cent. in that of wheat, the area under crop remaining as declared in January. The yield of wheat is considerably below several previous years, being less in both area and average per acre. The Department states the position of the supply as follows:—

	Bushels.
Quantity on hand on 31st of October last . . .	3,182,000
Estimated yield . . .	4,046,589
Imports of wheat and flour to 28th February, 1902 . . .	1,455
	7,230,044
Exports of wheat and flour to 28th February, 1902 . . .	196,196
Estimated consumption from 1st November, 1901, to 20th March, 1902 . . .	6,670,000
Required for seed, say 200,000 acres, at 2 bushels per acre . . .	400,000
	7,266,196
Apparent deficit . . .	36,152

Buyers are not taking kindly to the American flour that has been imported, and it is unlikely that there will be further importations from that quarter at present. Even Adelaide flour, once a prime favourite in this market, is not now regarded with favour, although its quality is beyond question.

South Africa.—TOBACCO CULTIVATION.—The *Tobacco Trade Review* seems to think there is a good prospect before a tobacco-growing industry started in South Africa. Speaking from special knowledge, says our contemporary, we have often directed attention to this potentiality, which is admitted by those who know the very varied districts of South Africa to be great. There are other tobacco-growing lands under British rule, but the Empire can still welcome the appearance within its own borders of a producer of the first class, such as this promises to be. A Cape Town authority says: "Hundreds and thousands of tons of tobacco have been grown in South Africa, the flavour of which was entirely distinct from British-prepared tobacco, and it is a moot point whether, with the application of science, both to the cultivation and to the manufacture, the quality cannot be materially improved. Then it is quite possible that it will be more popular than the American leaf, will solve the difficulty of the present competition, be an enormous staple article, and enrich the country; but it requires the application of British industry and British capital to produce the desired results."

Transvaal.—TRADE RETURNS.—The Customs returns of the Transvaal for the six months ended June last, show that the total value of imports during that time was £4,217,698, as compared with £1,143,192 during the corresponding period of last year. The Customs dues during the six months amounted to £527,065, against £168,446 during the corresponding period of

1901. The imports *via* Natal amounted to £1,825,420, those *via* the Cape to £2,017,989, and those *via* Delagoa Bay to £374,289.

INDIA.

Coal Production.—The latest returns of Indian coal production show that the industry, though still comparatively small, is steadily developing. In 1901 the output was 6,635,727 tons, as against only 4,066,294 tons in 1897. Bengal produces more than four-fifths of the total quantity. During 1900 and 1901 there was great activity in the opening of new mines and in the floating of new companies under the stimulus of higher prices that ensued upon the temporary rise in English coal prices. During 1902 prices have receded, and the rush to produce that followed upon the competition of buyers has been checked. The development of Indian mines has been closely associated with the growth of railways, which in 1901 consumed nearly one-third of the total output of coal. In recent years the demand for Indian coal for mills and factories has largely increased, especially in the neighbourhood of Calcutta. The recent improvements in railway communications between the great Jherria coalfield and Calcutta and Bombay will doubtless ensure a still more rapid growth of the industry. The discovery of new seams is reported from the Bengal coal region. The coal-owners are pressing for lower freights by rail and steamer. If this boon were combined with a reduced cost of output the consumption of coal both internally and abroad would certainly be promoted. The export of Indian coal to foreign ports is as yet relatively small. High prices of English coal sent up the Indian exports to 541,445 tons in 1900-01, but in 1901-02 there was a decline to 524,687 tons. The latest information from India shows that English coal imports into Bombay, to which coal can be transported from the Indian mines only at great expense, have increased considerably, this movement being favoured by abnormally low rates of freight. It is stated that the Indian mine-owners aim at provisioning with coal all ports from Suez to Singapore or beyond, and they propose to send commissions to Egypt, the Straits Settlements, and Japan to discover the best methods of extending the sale of Indian coal.

Cotton Export Trade.—The annual review of the Indian cotton season for 1901-2 has been published by *The Times of India*. Figures still demonstrate the tendency of India becoming a source of supply for the raw material for the spinning industries in the Far East rather than those for Europe. The report states:—In connection with the movement for increasing the supply of cotton for the spindles of England from British colonies and dependencies, in order that British spinners and manufacturers may be less dependent on the United States growth, it may be pointed out that the proportion of the shipments, from India now sent to this country is not encouraging so far as that dependency is concerned. During eight years of the total exports of Indian cotton, the proportion sent to the United Kingdom was 23.7 per cent., as against 71.7 per cent. to the Continent of Europe, 2.5 per cent. to Japan and China, and 2.1 per cent. to Calcutta and the Indian coast generally. For the cotton year 1901-2 the proportion to Great Britain was 0.7 per cent. only, to the Continent of Europe 41 per cent., to China and Japan 57.3 per cent., and to Calcutta and the coast generally 1 per cent.

German and Indian Indigo.—The British Consul-General in Marseilles, referring to the competition of artificial indigo made in Germany and France with the Indian natural indigo, says that the future of natural indigo depends on whether the old methods of the Indian indigo-planters can be sufficiently improved to enable natural indigo to be produced at a profit to India at a much lower cost than is the case at present. He is convinced, from the experiments already made, that this is quite possible. Artificial indigo is preferred by small dyers because it can be purchased in small quantities, and does not, like natural indigo, require to be stored and carefully watched. It is easy to keep and prepare for use, and is economical. It is pure and vivid in colouring, and uniform shades can be obtained with almost mathematical precision. The chemical compounds from which it is extracted—naphthalene and toluene—are cheap and unlimited in quantity. Artificial indigo is already manufactured in enormous quantities, but cannot yet supply the demand. Its price can, however, follow the price of the natural product, with a considerable margin of profit. As soon as the supply of artificial indigo is equal to the demand, it will control the market, and manufacturers could well afford to lower prices to a rate to which, under present conditions, Indian indigo cannot follow. To meet this fall the growing and preparing of Indian indigo should be so improved that planters could afford to place it on the market at a much lower price than is the case at present, yet with substantial benefit to themselves. The points in favour of the Indian product are that it gives more solidity to the cloth, and is therefore still in demand for dyeing in large quantities cloths that are expected to stand much exposure to sun and rain. The French Government still insists on the use of the natural dye for uniforms. The German Government, on the other hand, has given way, in view of the immense German interests involved in the industry of artificial chemical colours. The markets in the Levant, supplied from Marseilles, refuse the artificial dye owing to native objection to any innovation. Natural indigo has lost within the last 12 months from 10 to 12 per cent. in value under the influence of artificial indigo, in spite of the short crops in Bengal.

LABOUR MARKET.

UNITED KINGDOM.

Employment Changes.—The *Labour Gazette* for August states that there has been a slight recovery in the metal trades, but employment in these industries is still worse than a year ago. The wages of coal miners continue to fall. In the 222 trade unions, with an aggregate membership of 550,169, making returns, 21,859 (or 4.0 per cent.) were reported as unemployed at the end of July, as compared with 3.4 per cent. in the 216 unions, with a membership of 539,422, from which returns were received for July, 1901.

CHANGES IN RATES OF WAGES.

The changes in rates of wages reported in July affected 293,971 workpeople, and the net effect of all the changes was a decrease averaging 7.5d. weekly per head of those affected. Of the total number 15,631 received advances, and 278,280 sustained decreases. The changes of the previous month affected 343,486 workpeople, the net result being a decrease averaging 1s. 9.4d. weekly per head. During July, 1901, the number affected was 272,768, and the net weekly result was a decrease of 1s. 1.4d. per head. The principal advances reported during the month affected 6,400 ironstone miners in Cleveland, 1,500 limestone quarrymen, etc., in Wearside, 3,500 blast-furnacemen in Scotland, and 1,140 steelworkers at Eton. The principal decreases were those sustained by about 277,000 coal miners in South Wales, Monmouthshire, Scotland, and Northumberland.

TRADE DISPUTES.

Twenty-five fresh disputes began in July, involving 104,642 workpeople, of whom 17,907 were directly, and 86,735 indirectly

affected; the corresponding number of disputes in June was 11, affecting 10,679 workpeople, and in July, 1901, 28, affecting 8,148 workpeople. The increase in the numbers affected by disputes in July, 1902, as compared with a month and a year ago, is mainly accounted for by a strike of lads at a large number of collieries, the number of persons thrown out of work in this way being about 97,000. Of the other 24 new disputes in July, 1902, 1 took place in the building trade, 12 in the mining industry, 4 in the metal, engineering, and shipbuilding trades, 4 in the textile trades, and 3 in miscellaneous industries.

Employment in Mines and Quarries.—The general report and statistics relating to persons employed and accidents at mines and quarries in the United Kingdom and to the enforcement of the Mines and Quarries Acts has been issued by the Home Office as a Blue-book. The total number of persons employed at mines and quarries in the United Kingdom and the Isle of Man during 1901 was 933,366, of whom 839,178 were employed in or about mines, and 94,188 in or about quarries. Of the 839,178 persons employed at mines, 666,626 worked underground and 172,552 above ground; of the last-mentioned, 5,588 were women. Compared with the preceding year, there is an increase of 22,384 males working underground, and an increase of 1,912 males and of 365 females working above ground, making a total increase of 24,661 persons. The increase occurred entirely at coal mines. The total figure is the largest yet recorded. At iron and "other" mines there was a decrease of 1,092 males and an increase of six females. Compared with 1900 the number of persons employed inside quarries shows a decrease of 673, and the number outside quarries an increase of 956 persons. In 1901, 1,075 separate fatal accidents occurred in and about the mines and quarries of the United Kingdom, causing the loss of 1,229 lives. This is a decrease of 48 in the number of fatal accidents compared with the previous year, but an increase of 52 in the number of lives lost, owing to the explosion at the Universal Colliery, where 81 persons lost their lives. Of these fatal accidents, 978, causing the loss of 1,131 lives, happened at mines, and 97, causing the loss of 98 lives, happened at quarries. Compared with the previous year there is a decrease of 21 in the number of fatal accidents in mines and an increase of 81 in the number of deaths. It is pointed out that two-thirds of the explosions in mines were due to naked lights, the illegal use of matches, or the illegal opening of a safety-lamp.

EMIGRATION AND IMMIGRATION.

* * *The Imperial Institute acts in concert with the Emigrants' Information Office (which is under the direction of the Colonial Office), of 31, Broadway, Westminster, S.W.; and also with the British Women's Emigration Association, now temporarily carrying on its work in rooms at the Institute. The Handbooks and Quarterly Circulars issued by the Emigrants' Information Office may be obtained at the Commercial Intelligence Office. Special information and practical advice respecting Canada and Cape Colony will also be furnished by the Curators of these Sections.*

UNITED KINGDOM.

The British Women's Emigration Association.—The hon. sec. reports the number of applications received at the office in the month, July 21 to August 21, to be 989. There have sailed in the same time, under the care of the Association, 76 persons, viz.: to Africa, 32, and two Scotch families numbering 17; to Canada, 18; to Australia and New Zealand, 8; to the States, 1.

SOUTH AFRICA.—The month is marked by the announcement that Lord Milner has established our work already organised at Johannesburg as a Government Department under the name of the Women's Emigration Department, South African Expansion, Transvaal Province. The Government will finance the office and the hostel. There is also a promise of advancing the payment for women coming out. Fifty general servants are applied for; they will be sent out in parties under experienced matrons in empty troop-ships, probably about the middle of September.

The Committee at home regard this as a very great encouragement to their work. At the same time, it should be borne in mind by those intending to go out that the housing difficulty in Johannesburg, as indeed throughout South Africa, is very great, and that some time must elapse before it can be overcome. The consequent dangers, in the present state of the country, with large numbers of disbanded troops awaiting embarkation, must be obvious, and it is therefore necessary to adhere strictly to the rule that no one can be sent out who has not either employment assured beforehand or friends ready to receive them.

The fares, third class for indulgence passages, are only the actual cost of rations, which with extra necessities cost £2. These passages represent very simple accommodation, being berthing in two tiers in the women's ward. The feeding takes place in a separate saloon, where the travellers sit.

Second-class passages are given at frequent short intervals at £3. 6s. each. Our correspondents at Cape Town, the eastern ports, and Durban, obtain railway fare at half-price. At Port Elizabeth and East London and other inland places our correspondents are looking out for situations for home-helpers, to come from the class of farmers' and tradesmen's daughters. Concessions are given on the Rhodesian railways, and occasional cheap sailings by direct steamers to Beira. Hostel or lodging accommodation is secured as cheaply as possible; but all board and lodging is very dear.

It must be understood that the Colonial Office only permit us to send those women for whom actual employment has been obtained, either by their own efforts or through our Association and its Colonial correspondents, or women who can show they have relations or friends asking them to come out and settle with them.

Contributions towards the repayment of the money advanced for buying a suitable house in London for the convenience of our travellers, are needed, and will be gratefully acknowledged. We publish the details of the money so far received for the Hostel, the result of kind exertions on the part of members of both Committees, who have generously combined in subscribing and collecting liberal sums. This includes the loans, amounting to £1,100, for purchasing the lease (47 years) of 22, Upper Westbourne-terrace. The money is lent at 3 per cent. interest, and special donations towards the extinction of the debt are coming in.

There is a good deal of outlay to be provided for in getting into the house, some legal expenses, certain necessary repairs, a new kitchen range, fittings for the electric light, and blinds, as well as for completing the furnishing. Although over £540 has already been collected, further donations will be gladly received for the credit of the hostel account. These may be

addressed to the Secretary of the Hostel Committee at the British Women's Emigration Office, Imperial Institute.

LIST OF SUBSCRIPTIONS TO THE LONDON HOSTEL ALREADY RECEIVED TO END OF AUGUST, 1902.

£ s. d.		£ s. d.	
Sir Edgar Vincent	100 0 0	Miss Henderson	2 0 0
S. Newman, Esq.	50 0 0	Miss Russell	2 0 0
Lord Strathcona	50 0 0	Mrs. Western	2 0 0
Lady Kelvin	25 0 0	Mrs. & Miss Wedderburn	1 10 0
F. D. Mocatta, Esq.	25 0 0	Lady Amplett	1 1 0
Hon. K. Plunket	25 0 0	W. Carter, Esq.	1 1 0
J. F. P. Rawlinson, Esq.	21 0 0	Miss Dempster	1 1 0
S. Pierre Duncombe, Esq.	10 10 0	Capt. A. Douglas, R.N.	1 1 0
Miss Denison	10 0 0	Mrs. Robb	1 1 0
Miss Flower	10 0 0	G. Somervell, Esq.	1 1 0
O. D'A. Goldsmid, Esq.	10 0 0	Mrs. Spender	1 1 0
Miss Jones	10 0 0	W. J. Waddington, Esq.	1 1 0
Emil Reiss, Esq.	10 0 0	Sir Donald Mackenzie	
Hon. Mrs. R. Talbot	10 0 0	Wallace	1 1 0
P. Walker, Esq.	10 0 0	Mrs. Birbeck	1 0 0
W. A. Govt. (sub.)	10 0 0	Sir A. Cooke	1 0 0
Collected by Miss V. Little	8 0 0	Countess of Dunmore	1 0 0
J. Langman, Esq.	5 5 0	Mrs. C. Egerton	1 0 0
John Walter, Esq.	5 5 0	Mrs. Edmonds	1 0 0
Miss Spencer Bell	5 0 0	Admiral Field	1 0 0
Miss Bonham Carter	5 0 0	Miss Macan	1 0 0
Col. Kincaid	5 0 0	Miss Jackson (sub.)	1 0 0
Lady Knox	5 0 0	Susan, Lady Malmesbury	
Miss Lefroy	5 0 0	(sub.)	1 0 0
Miss Lewis	5 0 0	Lady Macnaughten	1 0 0
Lady Lovelace	5 0 0	Miss G. F. Martin	1 0 0
Miss Monk (sub.)	5 0 0	Lady Monkswell	1 0 0
Mrs. Moreton Phillips	5 0 0	Hon. G. Plunket	1 0 0
Ashley Stables, Esq.	5 0 0	Mrs. Parker	1 0 0
Miss Spottiswoode	5 0 0	Miss R. Talbot	1 0 0
Hon. Mrs. Thomas	5 0 0	Hon. Mrs. Thomas	1 0 0
Mrs. Tohill	5 0 0	Rev. A. L. White	1 0 0
Miss Tuke Tylor	5 0 0	Hon. Mrs. Wilkinson	0 10 6
Messrs. Willett	5 0 0	Miss Ada Byron	0 10 0
Mrs. H. Chamberlain	3 3 0	Mrs. Firebrace	0 10 0
Eric Debenham, Esq.	3 3 0	Miss Hartley	0 10 0
Mrs. Ernest Hills	3 3 0	Messrs. Mansford	0 10 0
Miss Booker	3 0 0	Miss Mildmay	0 10 0
E. Debenham, Esq.	3 0 0	Mrs. McLean	0 10 0
Major and Mrs. Hills	3 0 0	Miss Soames	0 10 0
Mrs. Cowell	2 2 0	A. White, Esq.	0 10 0
Lady De La Rue	2 2 0	Per Hon. Mrs. Thomas	0 5 0
Mrs. Blundell	2 0 0	Mrs. Kemp Welsh	0 5 0
Miss Canliffe	2 0 0		
Miss Denison (sub.)	2 0 0		
Hon. F. D. Fortescue	2 0 0		
		Total	£549 12 6

SUMS ADVANCED FOR THE PURCHASE OF THE HOUSE, 22, UPPER WESTBOURNE TERRACE, W.

£ s. d.		£ s. d.	
Miss Denison	300 0 0	Hon. Mrs. Paley	100 0 0
Mrs. L. Hardy	250 0 0	Hon. Katherine Plunket	100 0 0
Susan, Lady Malmesbury	150 0 0	Miss Balfour	100 0 0
		Miss Monk	100 0 0

CUSTOMS TARIFFS. UNITED KINGDOM.

ASSESSMENT OF DUTY ON CLEANED RICE.—A General Order (No. 47 of 1902) has recently been issued by the Commissioners of H.M. Customs, relative to the assessment of duty on Mixtures of Whole and Broken Rice. The following is the text of the Order:—

"The Board of Customs having had under consideration the question of assessing duty on Mixtures of Whole and Broken Rice (cleaned), now direct that the following specific rates of duty be charged on and after the receipt of this Order:—

"Rice (cleaned):—

- "Containing not more than 10 per cent. of Whole 3d. per cwt.
- "Containing more than 10 and not more than 50 per cent. of Whole 4d. "
- "Containing more than 50 per cent. of Whole 5d. "

"Uncleaned rice (whole or broken) will continue to be subject to the lower rate of 3d. per cwt. only.

"Where it is necessary to forward samples of importations to the analyst for assessing the proper rate, delivery of the goods may be allowed on a deposit being made sufficient to cover the duty."

BONDING OF RICE AND QUAKER OATS PERMITTED.—The Board of Trade are in receipt of a copy of a General Order (No. 52 of 1902), recently issued, with regard to the bonding of rice and quaker oats. The following is the text of the order:—

"Representations having been received as to the return of duty on rice and quaker oats cleared for home consumption, and which, under existing trade conditions, are ultimately exported in considerable quantities without undergoing any process of preparation or manufacture in this country, such as would entitle the goods to drawback;

"Collectors and other officers concerned are informed for guidance that the Lords of the Treasury, under Section 39 of the Customs Consolidation Act, 1876, have now been pleased to enumerate the goods specified in the first schedule to the Finance Act, 1902, with the exception of rice and quaker oats, as goods upon which the duties shall be paid on the first importation thereof, and which shall not be warehoused either for home consumption or exportation.

"The warehousing of importations of rice and quaker oats, either for home consumption or for exportation, is accordingly to be allowed under the Standing Regulations, and paragraph 4 of General Order 19/1902, is to be noted to that effect."

REMISSIONS OF DUTY ON MAIZE, MAIZE OFFALS, ETC.—With reference to the notice on p. 218 of this JOURNAL, respecting the revised duties on maize, maize meal, etc., the Board of Trade are now in receipt of a copy of a further General Order (No. 45 of 1902), containing the following provisions for the remission of excess duty paid on these articles prior to the 18th June, 1902:—

Applications for remission of excess duty paid prior to the 18th June, 1902, can only be received from importers or their recognised agents who actually paid the duty; and such applications should contain full particulars of each importation concerned, viz., names of importing ships, date and place of importation (in London, the station), date of payment of duty and amount, name of paying firm (specifying whether principals or agents), and any other details which may assist in establishing the claim. Where a claim is made by an agent proof of bona-fide agency will be required.

No claim can be recognised unless it is proved to the satisfaction of the Board of Customs that duty has been paid at the higher rate ruling prior to the 18th June, 1902, and that the excess duty has not been recovered from any person to whom the goods have been delivered after importation.

Subject to this condition, however, importers will be entitled to claim remission of the excess duty on any stocks which they can prove to have had remaining on hand on the 17th June, and on which the higher duty has been paid. Goods claimed as offals

must be identified on inspection by the officers, who will draw representative samples and forward the same to the departmental analyst.

COLONIES.

British Central Africa and North-Eastern Rhodesia.—EXPORT DUTY ON RUBBER.—The Board of Trade have received information from the Foreign Office to the effect that they have sanctioned the imposition, as from 1st September next, of a duty of 4d. per lb. on rubber exported from the British Central Africa Protectorate and North-Eastern Rhodesia.

Ceylon.—CUSTOMS AMENDMENT RESPECTING LIQUID FUEL.—The Board of Trade have received information, through the Colonial Office, to the effect that liquid fuel, with a flashing point not under 150 deg. Fahr., is to be exempt from the payment of harbour dues and Customs rent on importation into Ceylon, pending the amendment of Ordinance No. 20 of 1898, by which liquid fuel, the product of petroleum, was exempt from Customs duty when the flashing point was not under 200 deg. Fahr.

Natal.—PROHIBITION OF THE IMPORTATION OF HORNED CATTLE FROM CERTAIN AMERICAN PORTS.—With reference to the Proclamation No. 36 of 1902, prohibiting the importation of horned or polled cattle into Natal from certain countries in consequence of the existence of the disease of "Redwater," the Board of Trade have now received a copy of a further Proclamation, dated 14th June, 1902 (No. 42 of 1902), extending the previous Proclamation, so as to prohibit the importation of horned or polled cattle into the colony from any port along the coast of the United States from New Orleans to Charleston, inclusive.

REGULATIONS FOR THE LANDING AND DELIVERY OF PASSENGERS' BAGGAGE.—The *Natal Government Gazette* for 15th July, 1902, contains regulations for the landing and delivery of baggage of passengers arriving in the colony by sea. Passengers are informed that nearly all goods are liable to Customs duty on entry into the colony, and are asked to exercise great care to specify the articles correctly. A special declaration is required in the case of firearms, ammunition, and explosives of any sort. The regulations may be seen on application at the Commercial Intelligence Department of the Board of Trade.

New Zealand.—DECISIONS.—The *New Zealand Government Gazette* for 12th June, 1902, contains a copy of a Commissioner's Order, dated 11th June, 1902 (No. 691), notifying the following Decisions under the Customs Import Tariff of New Zealand:—

Articles, and how classed.	Rate of Duty.
*Corn-starch and potato-farina, in bulk, whether packed in casks, or bags, or cases, without internal packages, when imported by or for a manufacturing confectioner, on declaration being made by such confectioner that the importation is to be used as moulding starch—	Free.
As confectioner's moulding starch	Free.
*Gloy (paste for paper-bag making) in bulk	"
Photographs of persons in the colony taken or reproduced abroad—	
As photographs.	20 % ad. val.
*Steering wheels for ships, without machinery attached—	
As ship chandlery, not otherwise enumerated	Free.
Truck wheels for trucks used in the transport of coal from the mine—	
As tramway materials, not otherwise enumerated	20 % ad. val.
*Turbine for saw-mill, when supported by declaration—	
As machinery for saw-milling	Free.
Wax, ceresin—	
As wax, mineral.	1½d. per lb.

* Revised decisions.

St. Lucia.—AMENDED RATE OF IMPORT DUTY ON MALT LIQUOR.—The Board of Trade have received a copy of the "Customs Tariff (Amendment) Ordinance, 1902" (No. 7, of 1902), which was passed by the Legislative Council of St. Lucia on 19th of June, 1902, and assented to by the Governor on 1st July.

The present Ordinance amends the rate of duty imposed by the Customs Tariff Ordinance of 1895 on ale, beer, and porter, imported into St. Lucia in wood. The duty is henceforth to be 17s. per hogshead of 65 galls. (Winchester measure), instead of 6d. per gall.

INDIA.

DECISION.—A Customs Circular, dated 18th June, 1902 (No. 11 of 1902) states that the Government of India has decided that flint pebbles for use as rolling ballast in tube mills for the manufacture of cement are to be dutiable at the rate of 5 per cent. *ad valorem*, whether the pebbles are imported separately or along with the machinery of a mill.

FOREIGN COUNTRIES.

Belgium.—NEW PROVISIONS RESPECTING IMPORTED SPIRITS.—The *Moniteur Belge* for the 28th/29th July contains the text of a new Law, modifying previous legislation concerning the manufacture and importation of alcohols. The following is a translation of Article 6 of this Law, which affects the treatment of alcohols imported into Belgium:—

"The Government is authorised—

"1. To grant total or partial exemption from import duty to alcohols intended exclusively for industrial purposes, after previous denaturation; the regulations of Articles 14 and 16 of the Law of the 15th April, 1896, are applicable to this exemption;

"2. To reduce the import duties leviable on spirits in casks to a point not lower than the excise duties leviable on spirits of Belgian production. The duties thus lowered may be again raised, by Royal Decree, to the rate originally leviable."

France.—IMPORT DUTIES ON "COLONIAL PRODUCE."—With reference to the French import duties on "Colonial produce," the Board of Trade are now in receipt of information to the effect that the French Government have decided to continue the application of the minimum tariff to imports of such produce from the countries named in the above-mentioned notice, for a further period of six months.

France (St. Pierre et Miquelon).—IMPORT DUTIES ON TOBACCO.—The *French Journal Officiel* for the 5th ult. contains the text of a Presidential Decree, dated the 25th July, modifying as follows the list of exceptions from the General

Customs Tariff of France applicable to imports into St. Pierre and Miquelon from foreign countries:—

	Fcs.
Tobacco, leaf 100 kilogs.	75
„ for smoking or chewing, and snuff	75
„ cigars and cigarettes.	250

France (Senegal).—CUSTOMS TARIFF OF SENEGAL.—With reference to the Customs Tariff of Senegal, the Board of Trade have now received a copy of a recent issue of the *Journal Officiel du Sénégal et Dépendances*, containing the tariffs of import duties, consumption taxes, port and navigation dues, special taxes, and octroi duties now in force in Senegal.

The following appear to be the only modifications which have taken place in these tariffs since the publication of the notice above referred to.

Import duties and consumption taxes.—No consumption tax is now leviable on wines, spirits, beers, etc., but, as a consequence of the Brussels Convention of 8th June, 1899, spirits are subject to import duty at the rate of 140 francs per hectolitre of pure alcohol, in addition to the "Customs" duty of 7 per cent. *ad valorem* if the goods are of foreign origin. Wines and beers are liable to "import" duty at the rate of 5 per cent. *ad valorem* in addition to the above-mentioned "Customs" duty of 7 per cent. if of foreign origin.

Port and Navigation Dues.—Foreign vessels of two tons and under are not subject to registration dues when registered as French vessels, and foreign vessels of from 2 to 30 tons do not have to pay duty on the patent of registration.

Municipal Octroi duties at Dakar.—Kola nuts, formerly dutiable at the rate of 40 francs per 100 kilogs., are now subject to duty at the rate of 20 per cent. *ad valorem*.

The complete Tariffs may be seen on application at the Commercial Intelligence Branch of the Board of Trade.

Germany.—TAXATION OF SPARKLING WINES.—With reference to the new law for the taxation of sparkling wines in Germany, the Board of Trade are now in receipt of further information to the effect that the tax is leviable on all sparkling wines and similar beverages, whether home-made or imported, destined for inland consumption. Imported sparkling wines must, before they can be cleared through the Customs or taken out of bond for consumption, be provided with a special Customs label, bearing the words "Duty-paid sparkling wine" (*versollter Schaumwein*). Sparkling wines exported or placed in bond are exempt from the tax.

TARIFF CLASSIFICATION OF FILOSELLE AND FILOFLOSS.—The Board of Trade are in receipt, through the Foreign Office, of information to the effect that the German Customs authorities have been instructed to treat *filoselle*, for tariff purposes, as threaded and coloured floss-silk, dutiable under No. 302 of the Tariff, at the rate of 36 marks per 100 kilogs. (18s. 3d. per cwt.). *Filofloss* is to be dutiable as coloured thread made out of raw silk, dutiable under No. 303 of the Tariff, at the (conventional) rate of 140 marks per 100 kilogs. (£3. 11s. 2d. per cwt.).

LAW PROHIBITING THE PRODUCTION, IMPORTATION AND SALE OF SACCARIN, ETC.—The *Deutscher Reichs-Anzeiger* for the 21st July publishes the text of a Law prohibiting the production, importation, or sale in Germany of substances possessing a higher sweetening power than refined cane or beet sugar, and not possessing corresponding nutritive qualities. Exception is made in cases where such substances are intended for medicinal or scientific purposes. This Law came into force on the 1st April last, and supersedes that of the 6th July, 1893. The text of the Law (in German) may be seen on application at the Commercial Intelligence Branch of the Board of Trade.

Turkey (Roumania).—COMMERCIAL CONVENTION.—With reference to the Tureo-Roumanian Commercial Convention signed at Constantinople on the 12th August, 1901, the Board of Trade have received information to the effect that the ratifications of this Convention were exchanged on the 15th July, and that its provisions were put into force in Roumanian ports on the same day.

A list of articles of Turkish export affected by this Convention, including various kinds of fish, oil, fruits, carpets, etc., and of the special rates of duty thereon to be charged by the Roumanian Government, may be seen on application at the Commercial Intelligence Branch of the Board of Trade any day between the hours of 10 a.m. and 5 p.m.

TRANSPORT AND FREIGHTS.

The Freight Market.—Outward rates have declined in most directions, the exception being Colombo, which has paid 14s., an advance of 3s. 6d., since our last report. Other recent fixtures have been on basis of 4s. Genoa, 5s. Venice, 4s. 6d. Port Said, 6s. Las Palmas, 12s. Rio or River Plate. American markets are steady, and 2s. 6d. is still the current quotation for new season's grain. Australia continues quiet. Newcastle paid 6s. 6d. Frisco, 6s. 6d. Tjilatjap, 7s. Java, north side. Westport—Hongkong done at 12s. 6d. Black Sea shows a further advance, and recent berth fixtures have been on a basis of 11s. Odessa and Sulina. Azoff firmer, and is quoted at 12s. to 12s. 6d. Eastern markets continue in a state of stagnation, the single exception being Java, which has taken one or two boats at 20s. Mediterranean markets are unchanged. River Plate.—Owing to the sudden European demand for maize, rates have risen rapidly, and 18s. has been paid for a handy boat, San Lorenzo limit. Several boats have been chartered for Australia on a basis of 23s. to 24s. on d.w.—WEDDEL, TURNER & CO., August 26, 1902.

COLONIES.

Canada and South Africa.—The Canadian Government have contracted with Messrs. Elder, Dempster and Co., Furness, Withy and Co. Limited, and the Allan Line, for the running of a line of steamers from Montreal and Quebec to Cape Town and one or two other ports, which have not yet been decided on. The vessels are to be fitted with refrigerating machinery and the sailings are to be monthly, the first vessel leaving Montreal on the 18th October. It is expected that there will be a great development in the trade between Canada and South Africa, and the above line has been started in order to take advantage of the employment. There is reason to believe that a small subsidy will be paid to the new service to the Cape.

Mauritius.—SHIPPING FACILITIES.—The Merchant Service Guild have brought to the notice of the Board of Trade the serious inconvenience to ships and shipmasters arising through there only being one responsible official at the mercantile marine office at Port Louis, Mauritius. The Board of Trade referred the matter to the Colonial Office, who brought it to the attention of the Governor of Mauritius, Sir Charles Bruce. The guild have now received from the latter Department a copy of the despatch forwarded by Sir Charles Bruce, and from the appended extracts it appears that great improvements are to be effected:—(1). I have given the matter my careful consideration and have come to the conclusion that the most suitable arrangement is to bring the deputy-superintendent of mercantile marine under the

same roof as the superintendent, who will thus be able to carry on the business of the shipping office in the absence, through illness or otherwise, of the deputy. (2). The shipping office has accordingly been transferred to the port office, and I trust that the inconvenience complained of will not recur, and that there will be no cause for complaint in the future. (3.) Should, however, the arrangement, after a fair trial, not prove satisfactory, steps will be taken to amend existing legislation, and invest the clerk attached to the mercantile marine office with power to act in the absence of the superintendent and deputy-superintendent of mercantile marine.

FOREIGN COUNTRIES.

Argentine Republic and South Africa.—A regular steamship communication between Buenos Ayres and Cape Town has been established by the Argentine Government, and a Government transport, or, failing that, a chartered foreign steamer, will be despatched from the Argentine port on the 15th of each month with (principally) cattle and grain. The arrangement has been made for six months, to be then dropped or continued according to circumstances.

Bounties on Shipbuilding in Russia.—The British Consul-General at St. Petersburg states in his report for the past year that, in order to encourage the construction of merchant vessels and mercantile navigation generally, a commission was appointed under the presidency of the Grand Duke Alexander Mikhailovitch. This body elaborated a scheme providing as follows:—1. The grant to shipowners of loans, without interest, amounting to half the cost of construction of ships owned and built of Russian material in Russia; repayment is to be spread over 20 years in equal instalments, the vessels to be mortgaged for the amount due during that period. 2. Insurance premiums on ships to two-thirds of their value to be paid by the Government, the shipowner paying 2 per cent. per annum on the amount, while the remaining third of the value may be insured by the owner when he pleases. 3. To encourage the export of Russian goods in vessels of Russian construction the Government will repay half the cost of the fuel consumed in working the engines, provided such fuel is of Russian origin; the vessel claiming this privilege must load cargo at a Russian port for abroad to the extent of three-fourths of its carrying capacity. 4. All these privileges will be granted exclusively to shipowners of Russian nationality and to associations of which all the members are Russians, and they are to come into force from January 1 next year.

German West Africa.—A landing-stage, reaching far out into the sea, is to be built at Lome, in the German African colony of Togoland, at the cost of the State.

Russia.—PROPOSED NEW LINE TO THE STATES.—The Odessa correspondent of *The Times* says it is reported that an Italian Company is at present negotiating with the Russian Volunteer Fleet with a view to opening up a new regular line between Black Sea ports and North America *via* Italy by means of Volunteer Fleet vessels. The Italian Company proposes with certain of these vessels to maintain a regular passenger and cargo service between Odessa and Naples, and to make a bid for the emigrant trade between Italian ports and New York. It is proposed as an experiment to put on the new line two of the vessels of the Volunteer Fleet now in reserve, the vessels mentioned being the *St. Petersburg* and the *Orel*, two of the older of the fast vessels of the fleet. At present a definite plan in regard to an Odessa-Naples-New York service is said to be occupying the attention of the Volunteer Fleet Committee and the Italian Company, and a decision is looked for towards the autumn of the present year.

South America.—STEAMSHIP CO-OPERATION.—An arrangement has been concluded between the three mail packet lines running to the Peninsula, Brazil, and River Plate—viz., the Royal Mail Steam Packet Company, the Pacific Navigation Company, and the French Messageries Maritimes, under which passage tickets issued by one line are also valid to travel by either of the other lines on the route. This arrangement will give facilities to tourists which will enable them during a reasonable holiday to make themselves acquainted with the beauties of Rio de Janeiro and other foreign cities.

OFFICIAL AND COMMERCIAL CONTRACTS.

UNITED KINGDOM.

Ashton-under-Lyne.—TENDERS are invited, until the 8th inst., for MAKING and DELIVERING about 475 tons of CAST-IRON PIPES, from 6 inch to 12 inch diameter, including irregulars. Particulars (£1. 1s.) may be obtained from Messrs. E. H. Hill and Sons, 3, Victoria-street, Westminster, and Albert-chambers, Albert-square, Manchester.

Barnsley.—TENDERS are invited, until the 17th inst., for the CONSTRUCTION OF FOUR FILTER BEDS and other works near Upper Midhope. Particulars (£3. 3s.) may be obtained from Mr. J. Henry Taylor, Manor-house, Barnsley, and from Messrs. T. and C. Hawksley, 30, Great George-street, Westminster.

Brighton.—Tenders are invited, until the 8th inst., for the CONSTRUCTION, ERECTION, and MAINTENANCE OF PUMPING ENGINES, BOILERS, DEEP WELL PUMPS, ECONOMISER, and other machinery required at Falmer Pumping Station. Particulars (£5. 5s.) may be obtained from Francis J. Tillstone, Town-clerk, Town-hall, Brighton.

Menai Bridge.—TENDERS are invited, until the 8th inst., for:—(Contract No. 1). The removal of St. George's Pier—a stone structure about 150 feet long—the construction of a sea wall, promenade, etc. (Contract No. 2). The construction and erection of a pier and floating landing stage, consisting of iron piles, steel girders and pontoons, with greenheart dolphins, etc. Particulars (£3. 3s.) may be obtained from Mr. John J. Webster, M.I.C.E., 39, Victoria-street, Westminster.

Retford.—TENDERS are invited for SUPPLYING and ERECTING A PUMPING ENGINE complete, with DEEP WELL PUMPS capable of raising 35,000 gallons of water per hour. Particulars (£2. 2s.) may be obtained from J. B. Fenwick, engineer, Gas and Water Office, Retford.

COLONIES.

New South Wales.—The tenders for the construction of a bridge over Sydney Harbour were opened by the Government on July 1. The following were the tenders:—

Joseph Bentley, 26, Bristol-road, Leeds, £7,720,478.
Alex. Findlay & Co., Motherwell, Scotland, three tenders ranging from £1,523,837 to £1,661,866.
Wm. Arrol & Co., and Head, Wrightson & Co., £1,710,688.
Cleveland Bridge and Engineering Company, Darlington, England, £1,794,118.
Compagnie de Fives, Lille, France, £3,050,750.
E. and C. Bridge Company, England, three tenders ranging from £1,666,000 to £1,943,975.

J. Stewart & Co., Sydney, six tenders ranging from £1,112,859 to £1,933,194.

Gilbert Weaver, Sydney, £1,775,207.

Henning & Hildebrand, New York, £2,000,000.

The matter is now in the hands of a Bridge Board, specially appointed to consider the tenders.

INDIA.

Emigrant Ships Wanted.—The Crown Agents for the Colonies will, on the 1st December, receive TENDERS for SAILING SHIPS or STEAMERS to convey Indian emigrants from Calcutta to Demerara and from Demerara to Calcutta, and also from Calcutta to Trinidad and from Trinidad to Calcutta, for three or five or seven seasons, commencing on the 7th July, 1904. Particulars may be obtained on application at the Office of the Crown Agents for the Colonies. As the tenders will be referred to the Colonial Government for consideration, tenderers must be prepared to keep their tenders open till the 1st March, 1903.

Southern Mahratta Railway.—TENDERS are invited, until the 9th inst., for (1) SAFETY CHAINS, (2) SPIRAL SPRINGS for SAFETY CHAINS. Particulars (£1. 1s. each specification), may be obtained from the secretary, at the company's office, 46, Queen Anne's-gate, Westminster.

FOREIGN COUNTRIES.

Holland.—The Municipal Council of Amsterdam invite TENDERS, until the 8th inst. for the DELIVERY and LAYING of the entire net of CABLES for the Municipal Electrical Works, consisting of about 150 kilometres of divertible steam cables, about 70 kilometres of direct steam cables, about 25 kilometres of wire and telephone cables, with the necessary appurtenances. Particulars (4s. 2d.) may be obtained from the Municipal Printing Office, and at the office of the Director of the Electrical Works, O.Z., Achterburgwal 213, Amsterdam.

Portuguese West Africa.—TENDERS are invited until the 17th October, for the SUPPLY of MEDICINES for the hospitals of the province of Angola for two years from 1st January next. The unit of weight in all cases is to be the kilogramme, and the prices must be expressed in reis; but the freight and insurance, the latter to be taken out by the contractor, are on account of the State. The proposals should be based on all the regular medicines, etc., announced in the last catalogue of the firm of Collin. A provisional deposit of 500 milreis, or about £86. 10s., is required to qualify any tender.

Russia.—The ST. PETERSBURG STADT-AMT (Town Council) require TENDERS, until the 1st November, for the RECONSTRUCTION of the THREE TOWN TRAMWAY LINES, hitherto worked by horse traction, to ELECTRICAL POWER, and the Construction and Equipment of an Electric Power Station. Particulars will be sent free at once either by post or wire. Applications should be addressed to:—Stadt-Amt, St. Petersburg, Russia.

Uruguay.—TENDERS are invited, until the 15th December, for the CONSTRUCTION of SANITARY WORKS in the Port of Montevideo. The works to be constructed consist of (a) a tunnel, in rock, of 1,278 metres length, 365 metres height, and 3 metres in breadth; (b) a main collector-sewer of 1,157'60 metres + 1,283'30 metres long, in oviform section 1'80 metres and 1'70 metres in height respectively in earthen subsoil; (c) a secondary collector 2,016 metres long of oviform section varying from 1'70 metres, 1'25 metres, and 0'98 metres height, partly in rock and partly in earth; (d) the auxiliary collectors, inspection chambers, etc. Particulars can be obtained in Montevideo, on application direct by letter to the "Ministerio de Fomento," and in Europe through the respective Legations.

COMMERCIAL LAW INTELLIGENCE.

Commission.—This was an appeal from a judgment of Mr. Justice Mathew. MR. JOHN PRESTON sued MESSRS. FURNESS, WITTH & CO. for commission on the sale of three steamers. In 1900 plaintiff was asked to sell certain steamers which were either built by defendants or in which they were interested, and he offered them to the Holland-American Line. In February, 1901, the directors of the Holland-American Line came over to this country and wrote letters to various shipbuilders in the North, including defendants, and they afterwards paid a visit to defendants' shipbuilding yards to see what was being built there. They ultimately purchased three of the defendants' steamers at £80,000 each, and plaintiff now claimed 1 per cent. commission on the total, contending that the sale resulted from the introduction of the previous year. It was stated in defence that the steamers sold were entirely different from those plaintiff had endeavoured to sell in the previous year, and that the directors of the Holland-American Line were in communication with defendants as far back as 1898 with reference to building ships. Mr. Justice Mathew had given judgment for plaintiff for £500 for commission on the sale of the three steamers, holding that plaintiff did to some extent bring about the sale, but did not wholly bring it about. Against this judgment both parties appealed, the plaintiff on the ground that he had not been given a sufficient amount for commission. Their Lordships allowed defendants' appeal, with costs, and dismissed plaintiff's cross appeal, with costs, it being held that there was no evidence that the sale of the steamers was effected through plaintiff's intervention at all, and that he was consequently entitled to no commission.

International Law.—Before the Lord Chancellor and Lords Macnaghten, Brampton, Robertson, and Lindley, in the House of Lords, the case of his Excellency REAR-ADMIRAL JOSE RAMOS YZQUIERDO Y CASTANEDA and others v. THE CLYDEBANK ENGINEERING AND SHIPBUILDING COMPANY and the Liquidators of the Company was heard. This was an appeal from a decision of the Second Division of the Court of Session in Scotland reversing a judgment of the Lord Ordinary. The appeal raised an important question of international law. The respondents undertook to build four torpedo-boat destroyers for use in the Spanish Navy, and to deliver them by specified dates. The contracts were completed, and the vessels delivered, the company receiving the stipulated price, but they, it was alleged, were not delivered by the contract time, and an action was brought in the Scottish Court to recover damages for the delay in the delivery. The plaintiffs in the action were Rear-Admiral Don Castaneda, the Spanish Minister at the time when the action was brought, two gentlemen who were described, the one as chief and the other as commissary of the Spanish Royal Commission in London, and the Commission itself. The defendants maintained that the contract having been for the supply of warships for the Spanish Government, the King of Spain alone could sue in the action. The Lord Ordinary (Lord Low) held that the Spanish Minister of Marine had a title to sue, and gave judgment for the appellants, but the judges of the Second Division, Lord Young dissenting, set aside his decision, being of opinion that the King of Spain was the proper person to sue. The appellants now contended that this judgment should be set aside on the ground that they had a good

title to sue, because the Minister of Marine was named in the contracts as principal, and that by the law of Spain he was the Minister of State to sue on such contracts; that there was no rule of international law, nor in the law of Scotland, that the King only of a foreign monarchy could sue in the Courts of this country upon such contracts, and that the dismissal of this action for want of title would be a failure to observe international comity. The Lord Chancellor said the simple question was whether there was a right on the part of the Minister of Marine to have the contract enforced in this country. He thought there was, and he therefore moved that the judgment of Lord Low be restored. The other noble and learned Lords expressed a similar opinion. The judgment of the Second Division was accordingly reversed, and judgment was ordered to be entered for the appellants, with costs.

Municipal Tramways.—An important point in connection with the taking over of tramways by local authorities was raised during negotiations between THE MANCHESTER CARRIAGE COMPANY (LIMITED) and the CITY CORPORATION, and was ultimately submitted to the High Court in the form of a special case, stated by Sir Frederick Bramwell, the arbitrator appointed to assess the amount due to the company by reason of the corporation having relieved them of their undertaking. In conjunction with those constructed by themselves the company worked other lines leased to them by the corporation. The lease having expired, the corporation took possession, and under their statutory powers called upon the company to sell to them the rest of the system, their intention being to electrify the whole and work it themselves. The company asked that in the valuation the depôts, cars, and horses provided by them should be taken into account. The corporation demurred to taking over the whole, on the ground that they would be of very little use to them, but expressed their willingness to pay a proportionate sum. The arbitrator found in favour of the company, awarding them £496,068, but found alternatively that, in the event of the Court holding that the contention of the corporation was correct, the sum to be paid should only be £229,353. His Lordship (Mr. Justice Bigham) supported the arbitrator's award, giving judgment for the larger sum, with costs.

Trade Marks.—Lords Justices Vaughan Williams, Romer, and Mathew decided the question of MESSRS. BASS'S trade mark, the validity of which had been disputed, and judgment given by Mr. Justice Kekewich in favour of the disputants. Messrs. Bass appealed. On the application of JOHN TAVENPORT, brewer, of Birmingham, Mr. Justice Kekewich ordered the Registrar of Trade Marks to rectify the register by striking off several of Bass's marks, including the well-known diamond and equilateral triangle marks. These had been used by Bass & Co. for thirty years prior to the Trade Marks Act of 1875, and they were registered as old marks. The learned judge in the Court below held that the effect of the registration was to give Messrs. Bass a monopoly of the device of a diamond, which was common to all the trade in 1876, and he therefore directed the marks to be removed from the register. Messrs. Bass contended that, being early in the field, they were able to adopt a device combining simplicity with distinctness, and this constituted a good trade mark. Their Lordships allowed the appeal with costs.

COLONIES.

Fruit from Canada.—The Department of Agriculture at Ottawa has issued the following notice:—The Government of the Dominion of Canada last Session passed the Fruit Marks Act, the Minister of Agriculture, the Hon. Sydney Fisher, with the assistance of Professor Robertson, Commissioner of Agriculture and Dairying, having so framed the measure as to render improper packing and inaccurate grading of quality an impossibility. So stringent are the provisions of the measure that on fruit packages packed or marked fraudulently, the inspectors (of whom there are many), may, after notifying the packer, either by letter or telegram, place the words "falsely packed" or "falsely marked" on them, and a fine of £8 may be imposed for illegally removing the inspector's brand. Merchants are held responsible for the fruit they offer for sale, or for fruit in their possession for sale, unless the original wrongdoer can be found, and the penalty for a violation of the law with reference to packing and marking is not less than 1s. and not more than 4s. 2d. per package; while for obstructing an inspector the fine ranges from £5 to £100. The fines, which are recoverable on summary conviction, are divided equally between the informant and the Crown. Inspectors are given large powers under the Act to enter premises for the purpose of making an examination and to detain shipments of fruit for the same purpose. The packer, however, is amply protected by the stipulation that immediate notice must be given by the inspector to the packer when fruit, which at all times is at the risk of the owner, is branded or detained, and the inspector who exceeds his authority is subject to a heavy penalty. The main points of this Act may be summed up as follows:—(1) The face of all fruit packages must fairly represent the fruit throughout; (2) Closed boxes and barrels must be marked with the name and address of the packer, the variety of the fruit, and its grade; (3) It is an offence within the meaning of the Act to sell, to offer for sale, or to have in possession for sale, fraudulently packed or marked fruit, even when the buyer and seller are ignorant of the fact, as well as when one or both have knowledge of the fact; (4) The Act does not prevent the packing or selling of any grade of fruit that is properly packed and marked; (5) The Act does not provide for the inspection of particular lots of fruit at the request of the buyer or seller; (6) Commission merchants who, after notice, handle fruit put up contrary to the provisions of the Act, will be proceeded against. Already the beneficial effect of this Act is being felt, and when it is fully known that dishonesty in packing and describing Canadian fruit does not exist, an enormous impetus will be given to the Canadian fruit industry in Great Britain and the other markets of the world.

Gibraltar.—The report of the Colonial Secretary of Gibraltar for the past year shows a revenue of £71,106 and an expenditure of £63,812, being a considerable increase in revenue, due to increased Customs receipts on malt liquors and tobacco, and a smaller increase in expenditure as compared with the previous year. About 40 per cent. of the revenue is derived from the Customs duties. The revenue of the colony has steadily increased from £51,893 in 1897 to £71,106 last year, and the expenditure has increased in proportion. At the end of the year the assets exceeded the liabilities by over £20,000, and the only public debt the colony has was a loan from the savings bank for the complete installation of the electric light, the balance of which was £18,780. The population is 27,460, 6,475 being the number of the military. The sanitary condition of Gibraltar is stated to be satisfactory, and great improvements have been made in houses which were formerly very insanitary. Constant supervision is maintained over the food supplies of the town, the bakeries, public-houses, etc., being carefully inspected. Water for flushing is abundant, and the fresh water supply has been found capable of meeting a demand double that of any previous year. Good progress has been made during the year with the new coaling and commercial mole, which is being constructed by contract under Admiralty supervision.

BRITISH CONSULAR REPORTS.

Austria-Hungary (Prague).—THE SPIRIT INDUSTRY OF AUSTRIA.—The British Consul at Prague, in his report for last year on the trade of Bohemia, gives an interesting account of the spirit trade of Austria, which has reached enormous proportions in recent years. Spirits in Austria and Hungary, he says, are manufactured out of grain, molasses, and potatoes. The largest distilleries using molasses are in Bohemia, Silesia, and Moravia. In Hungary grain is chiefly used, although many of the distilleries are also adapted for working with molasses. The only distillery which uses molasses alone is at Raab, but it is one of the largest on the Continent. In Austria, spirit is distilled from grain in factories in which yeast is produced, the largest being in the neighbourhood of Vienna. Potatoes are chiefly used in Galicia and Bukowina, and in parts of Moravia and Bohemia. The distilling industry in Austria-Hungary dates from the 16th century, but it was only in the latter half of the last century that it became such an important source of revenue to the State. The spirit tax rose from some few hundred kronen in the early decades of the last century to the large sum of £6,133,333 in 1901, and besides this it also contributes largely to the local revenues of the several provinces and communities. Not only is this industry of great fiscal value, but it is of great importance to agriculture, and consumes large quantities of the produce, and also provides food for the cattle. With the increasing areas of beet and potatoes under cultivation during the latter part of the last century, many distilleries were erected on agricultural estates, as well as others on a purely industrial basis; to-day they form an enormous industry, equipped with the latest technical methods of producing spirit. Not only is spirit an article of drink, but it is also largely used in many industries. The spirit market during the year 1901 was unsatisfactory, because of German competition in spirit-importing countries, reduction in the value of Austrian ex-contingent spirit, the rich potato crop causing increased production, and, lastly, the addition to the spirit tax which came into operation in September last. For a few years Austrian distillers took the leading place in the world's markets. Spain, Japan, and, above all, the Levant, were her chief customers. This has, however, changed; the export to Spain and Japan has ceased in consequence of prohibitive import duties, and Russia and Roumania now compete with her trade to the Levant. Both of these countries grant high export premiums to their spirit industries. Latterly, the German spirit ring, in order to get rid of their enormous stocks, have flooded overseas countries with their spirit, the consequence being that prices have fallen to such a low point that Austrian producers are unable to compete. During the last few years the number of refineries built has been out of all proportion to the expansion of trade, and this, combined with the competition, has reduced the margin of profit to very small dimensions. The agricultural group of distillers have, however, in consequence of the financial assistance granted by the Government and the heavy yield and good quality of the potato crop, done well.

China (Fu-chau).—THE VANISHING TEA TRADE OF CHINA.—The British Consul at Fu-chau discusses in his last report the causes of the decline in the tea trade of China, which he describes as "a vanishing industry." In the first place there is the neglect of the native grower to use due care in the manipulation of the leaf when growing and being picked, as well as in the preparation for export. The means of ensuring this has been repeatedly indicated to him and put within his reach, but with no result. He has been in turns implored, scolded, and lectured, but all to no purpose. Some years ago a circular was issued by Sir Robert Hart warning tea-growers that, owing to the superior methods prevailing in India, the trade was slipping away from China. It was recognised by Europeans interested that the progress made by India and Ceylon had been secured by the substitution of machinery for hand labour. Machinery was accordingly imported. While Formosa was still Chinese the Governor imported into the north of the island, not only the machinery considered desirable, but even an expert from Assam. But neither in Formosa nor in Fu-chau have these devices proved of any avail. Next there is the change which has come over the public taste in Europe. When Assam and Ceylon entered into the competition with China it was soon apparent that the liking for their products was increasing rapidly, and China tea was in no long time hopelessly distanced. It is likely that, as regards delicacy of flavour and aroma, the teas of China are still assured of the suffrages of the cultivated few. Teas from the nearer East are admittedly coarser of taste and contain a larger percentage of tannin, on which account they are condemned by medical men as prejudicial to digestion. But they make an attractively dark brew and are economical. Thirdly, the trade in Indian and Ceylon teas has been fostered by judicious and persistent advertising, to which the Chinese merchants will not resort. Lastly, the trade is crushed by an excessive export duty. When the duty on tea was first made specific it no doubt represented fairly enough the 5 per cent. *ad val.* sanctioned by treaty. The diminishing value of teas has, however, resulted in the export duty of to-day representing 40 instead of 5 per cent.

Denmark (Copenhagen).—BUTTER EXPORT.—In a report to the Foreign Office on the trade and commerce of Denmark for 1901, H.M. Consul at Copenhagen gives the following particulars of exports: "The export of butter in 1901 was 110,000 cwt. more than in 1900, and, as prices ruled high, the profits increased to about £72,000. The prices on smoked and salted bacon were most profitable, and although the exports have decreased by about 50,000 cwt., there remains a profit on this account of £120,000 more than the preceding year. The export of eggs also shows a great increase over that of 1900, namely, 2,500,000 score, valued at £175,000. Live cattle, horses, hides, and skins show a decrease in 1901, compared with 1900, but altogether the sale of agricultural produce, has, in 1901, amounted to £14,600,000, against £14,000,000 in 1900, so that the gain works out at £600,000. Denmark's total export of butter in 1901 was 1,705,000 cwt., against 1,531,000 cwt. in 1900, an increase of 174,000 cwt. Butter in casks amounted to 1,663,000 cwt., against 1,495,000 cwt. in 1900, and it will be noticed that the largest increase is for this kind of butter. This increase is chiefly due to an increase in the Danish production of butter. Danish butter (in casks as well as in tins) works out as follows:—1,337,000 cwt. in 1901, against 1,225,000 cwt. in 1900, which accordingly shows 112,000 cwt. to the good. To a certain extent the continuously increasing consumption of margarine in Denmark has an influence on the butter export, but it is chiefly the butter production itself which increases year by year, and the reason of this, undoubtedly, is on account of the live-stock being kept up to a high standard, and the greatest attention and care which is given to each cow, particularly in not keeping animals which are not good milkers. Besides the export of Danish butter, the Danish transit trade with foreign butter is also increasing considerably. Denmark exported in 1901, 368,000 cwt. of foreign butter, against 306,000 cwt. the year before, a gain of 62,000 cwt. This is due principally to the trade in Siberian butter. Altogether in 1901, 304,000 cwt. of Russian butter arrived, against 250,000 cwt. during 1900, and out of this amount (304,000 cwt.) the greater part came from Siberia, the supplies of Finnish butter having diminished of late. As usual, nearly the whole Danish butter export was to the United Kingdom, viz., 1,620,000 cwt. out of the total 1,705,000 cwt. As far as the Danish exporters of butter were

concerned, the year 1901 was not satisfactory. Generally speaking, the average prices were higher than 1900, and the producers have certainly obtained higher prices; but for the merchants the export trade showed no profit, and advances were at times almost nothing, and it was, especially during the first months of the year almost impossible for merchants, when exporting, to obtain the prices they had paid the producers, plus expenses incurred. Towards May the market improved, and during summer was firm and good."

Tripoli.—FORTY YEARS OF THE CARAVAN TRADE.—The British Consul-General in Tripoli has prepared an interesting report on the movements of trade in that province during the last forty years. In reference to the caravan trade with the Sudan, which forms about a fourth of the total trade of Tripoli, the Consul-General states that the pioneers of trade were the merchants of Ghadamés, a small unimportant town without local trade, near the Tunisian frontier, about twenty days' journey from Tripoli. By reason of their superior intelligence, capabilities, and honesty, and aided by the geographical position of their town, these men established themselves many years ago in Tripoli, and enjoyed the monopoly of the trade. They sent periodical consignments of goods to their agents in Ghât, Kanem, Bornu, Kano, and Timbuctu, receiving in exchange ivory, ostrich feathers, and gold dust for export to European markets. In 1873, however, the Tripoli merchants began to compete largely with them, forming caravans to the Central and Western Sudan, and, owing to the high prices of feathers in Europe, very large profits were made. In 1882 a heavy fall took place, and the merchants suffered severely. Towards 1890 feathers again rose in price, to fall later on, but still fair profits were made by those whose means allowed them to continue in the trade. But in 1893 came Rabah's invasion of Bornu, entailing destruction of the Tripoli caravans then in the country, and the total stoppage of caravan traffic. Bornu was the chief market of Tripoli, and her ivory and feathers commanded the highest prices in the European markets. Traders had then to fall back on Kano and Wadai, the trade being done principally through the port of Bengazi, but between 1895 and 1901 came extensive pillages of caravans to and from Kano in the *Hinterland*, because of tribal wars, and heavy losses were sustained, chiefly by the Ghadamseen merchants of Tripoli, who, as usual, were most largely concerned in the traffic. At the present time little is being done; the trade has been thrown back a year, and last year's consignments of goods for Kano, which had been detained at Ghât awaiting events, are only now beginning to start, on receipt of better news as to the security of the roads. Since 1887 a large importation of tanned goat skins from Kano, all of which goes to New York, has begun, and is apparently on the increase. In peaceful years the caravan journey, out and home, used to occupy about eighteen months, and the profits amounted to about 50 per cent. on the outlay. The great drawback to any important development of this trade, even if Kanem and Bornu were once more open to commerce, is the cost of camel transport through the absence of roads, the sandy deserts, lack of water, and dearth of and mortality amongst animals. Moreover, the Central African trade is likely to be diverted in the future to the waterways of the Benue and Niger.

United States (San Francisco).—In a report to the Foreign Office on the trade of San Francisco and district for 1901, H.M. Vice-Consul says that the expectations of a prosperous year for California were, on the whole, fully realised. "The yield of wheat, which continues to be the staple product of the State, was larger than in 1900, although the returns to the farmers were not so good as in that year. Fruit-growers enjoyed a prosperous season, owing to the high prices ruling in the Eastern States, where the bulk of the crop is disposed of. Beet-sugar was depressed in price, but the output exceeded all previous records. Mining was fairly prosperous, and increasing attention is being paid to the development of base metal properties. The manufacturing interests of the State have been stimulated by the rapid development of the oilfields, which, with the proposed plants for the transmission of electric energy, assure an unlimited supply of cheap power. In connection with the development of the oilfields, it should be noted that exporters are likely to have to pay increased rates for the carriage of their grain to Europe. Owing to the fall in price, it will be impossible to import coal profitably from either the United Kingdom or Australia, and shipowners will be forced to demand higher rates of freight if they are compelled to send their vessels to this port in ballast. In many respects the past year has been important in the annals of San Francisco. Its importance lies, not so much in the volume of the commerce by sea, as in the development of broader commercial relations and the establishment of trade conditions entirely different from the methods in vogue among the business men here for so many years. Merchants seem to have enlarged their ideas, and are beginning to reach out for the growing trade of the Pacific Ocean. They begin to realise that through their efforts San Francisco, before many years, may become the greatest distributing point on the Pacific. This feeling appears to have originated with the acquisition of the Hawaiian and Philippine Islands. Taking into consideration the fact that the movement from the Hawaiian Islands no longer appears in the Custom-house records, the imports and exports make a fair show. The bank clearings again surpassed all records, and increased by the substantial sum of £30,636,482 as compared with 1900. Real estate exhibited more activity than for many years, and the class of buildings being erected testifies to the faith investors possess in the city's future. Capitalists from the Eastern States are regarding California with growing favour as a field for investment. Several large undertakings have been projected during the year, the most important transaction being the purchase by a Baltimore syndicate of the principal street railway system of San Francisco for about £3,500,000."

FOREIGN CONSULAR REPORTS.

A New Industry for the West Indies.—CATTLE FOOD FROM SUGAR CANE.—According to the American Consul at Antigua, experiments have been made by Mr. George Hughes, a director of one of the largest sugar estates in the British West Indies, which will result in the formation of a profitable industry in the manufacture of a new cattle food, to which the name of "molascuit" has been applied. It is a composition of molasses and cusc-cusc of bagasse, the finest part of the fibre of sugar cane. Fifty per cent. of cusc-cusc is digestible and nutritious. The proportions of the composition are 80 to 85 per cent. of molasses and 15 to 20 per cent. of cusc-cusc. This composition is air-dried and may be made by utilising the gases from the factory furnace. When ready for the market it presents the appearance of very finely ground oil cake. There is another preparation in use known as "molassine meal," made from beet-sugar molasses and a vegetable matter, which sells at about \$32 per ton and has a very good demand. Molascuit can be sold at about 20 per cent. less and can be shipped in bags. As a by-product of sugar it might be of considerable value to planters, who would thus have two ways of disposing of molasses—in making rum and molascuit. The matter has been brought before the Board of Agriculture with a view of getting the preparation officially recognised, so that uniformity may be

obtained. I have enquired, adds the Consul, of sugar-planters if they could afford to use bagasse for this purpose, in preference to utilising it for fuel, and was told that only a very small portion—and that the finest part of the fibre—of bagasse was required in the preparation.

Demand for Lumber in China.—The United States Consul at Niuchwang is convinced that the future demand in China for Pacific Coast lumber will be both extensive and permanent. For more than 1,000 miles up the great valley of the Yangtze there is practically no timber in sight. The plains, hills and mountains are absolutely bare of forestry, except where, here and there, a few trees have been carefully preserved. South of the Yangtze, there is some timber to be found on the Min river, in the province of Fukien, but it is mostly a young growth of poor pine. North of the great river there is no timber until the Yalu river, which forms the boundary between Korea and Manchuria, is reached. In the Yangtze valley, the only available timber is far up the river Han, on the north side, and along the head waters of the streams in the province of Hunan, on the south. This timber is floated in great long rafts down the river to the market at Hankau. It is mostly a soft pine, of small bulk and young growth. A hard wood, very much resembling ash, comes from the provinces north of Hupeh, and is extensively used in the manufacture of guns at the great Hankow arsenal. A considerable quantity of timber is brought into China from Korea by the Chinese junks, which sail along the coast and up many of the rivers. Most of it consists of fir and soft pine logs, flattened, squared, or round. It is afterwards cut up by the usual whip-saw process, in vogue in China. In many instances the contractor buys the logs and has them carried to the building he is erecting, where he cuts the lumber to suit his requirements. Japan also furnishes a large amount of timber to China, and in the market for railroad ties or sleepers. The Japanese ties are both hewn and sawn, and are mostly of hard wood resembling oak, but rather brash and easily broken. They appear to make a good railroad tie, although there is some complaint that they do not last long. It is thought, however, that this defect could easily be remedied by cutting down the trees at the time of the year when they contained the least sap. These ties come from Hokkaido, the northern island of Japan. On the island of Sakhalin, the great penal colony of Russia, there is another supply of large quantities of timber for the markets of China. The island has splendid forests of fir and pine. For furniture and interior finish, a hard red wood known as teak is extensively used. This and similar timbers are brought in large quantities to China from the Philippines and other southern islands. These are exceptionally fine woods, but are becoming expensive. In China probably more wood is used in coffins than for any other purpose. The coffins are made of lumber from 4 to 10 inches thick. It is not a high estimate to say that from 8,000,000,000 to 10,000,000,000 feet of lumber are annually thus utilized. The great majority of houses are built of mud and bricks, or mud and straws or millet stalks; very little lumber is used. The roofs are made of either tiles or straw and mud. Next to coffins, the greatest use for lumber in China is for boats. While there are no statistics on the subject, it is safe to say that the number of craft runs into millions. The vast coast line, the enormous rivers, the wonderful canal systems of China are all teeming with boats of every description, propelled by steam, sail, towline, or oars, operated by both hand and foot. Enormous quantities of wooden buckets and small wooden tubs are used in every district in China. Oregon pine would make most satisfactory buckets and tubs for Chinese use. The Consul has been able to locate only two mills in all of China. One is near Fuchau, and has but a small capacity; the other is at Niuchwang, and has just been started. The latter is a small single circular saw mill, which cuts about 2,000 feet a day. This mill was imported from Michigan, and seems to meet the requirements. A good many small mills can be sold in China; certainly, a number could be used to advantage at Tientsin, Shanghai, Hankau, and other places. Cheap mills, built for cutting a few thousand feet of light logs a day, would be the most likely to meet with sale.

Openings for Machinery.—The United States Consul at Budapest writes that most of the machinery and manufactures on the market of Croatia-Slavonia (previously belonging to the Kingdom of Hungary) are of German make. Machinery, bicycles, type-writers, cash-registers, etc., are to be found, though in limited quantities. There is plenty of room for more, and there are good chances for pushing sales. There is a good opening for all machinery used in factories; for agricultural machines and implements, bicycles, automobiles, typewriters, and for shoes. Direct trade is advantageous to both parties. Firms should send out capable agents. They should speak German if not also Serbo-Croatian, which is the language of Dalmatia, Bosnia, Herzegovina, and Servia. As to conditions of sale, prices should be quoted c.i.f. Fiume. Boxing or coating may be charged for extra, but at cost price. Machinery must be set up and installed, and all preliminary instructions given by the seller free of charge. Buyers are willing to furnish pulleys, belting, countershafts, etc., and all necessary help for fitting. A specified time for the shipment is generally set by the buyer. Cash terms of payment are impossible; Croatian merchants are not used to them. Thirty days after a machine is set up, one-half the price will be paid, the other half by three months' draft or the like. These are the only conditions that will receive consideration. In the case of other manufactures, similar conditions of sale are expected. The Servia Farmers' Association Union, with headquarters in Zagreb, is a union formed of all the Servian farmers' associations in the Austro-Hungarian monarchy. This association purchases agricultural implements for its farmer members, who re-pay on the instalment plan. A good advertisement in the union's paper, the *Privednik*, would be found profitable. Dairy machines are needed in large quantities, especially separators and churners. A German firm is monopolising this branch of the machinery at present. A light, strong and cheap plough would also sell well. Firms wishing to do a regular business should have a branch office in Croatia, with a stock of all the required implements, preferably at Mitrovica, the centre of the farming region of Slavonia. Machines must not be too complicated; the simpler the better.

Opening for Railway Material and Sugar Machinery.—The representatives of a syndicate of Dutch capitalists, Messrs. Von der Ben and F. W. Bolk, of Stork Frères, Hengelo, Holland, are reorganizing the large sugar plants in Rio and Sergipe. They want, among other things, electrical sugar machines of every kind, including cane crushers—not cutters—and dynamos and motors, variously described as of 220 kilowatts, 330 effective horse-power, 220 and 440 volts., in short, everything requisite for the installation of large sugar refineries. The same gentlemen are also interested in sugar refineries in Java, and they are desirous of securing the sole agency for American rails for narrow gauge roads of from 75 to 100 centimetres (29½ to 39¾ inches) in width, and for locomotives and other rolling stock to be used in the transportation of sugar over such roads. Houses desiring to enter into negotiations for supplying the machinery required should address Stork Frères, Hengelo, Holland.—*United States Consular Report.*

CHAMBERS OF COMMERCE REPORTS. UNITED KINGDOM.

Walsall.—At the meeting of the Council on July 28, in reply to a letter sent by the Chamber, a communication from Mr. Chamberlain on the question of the introduction of the decimal system to the colonies was read. The President (Mr. F. Rathbone) said that as the subject had not been proposed for discussion he could not himself undertake to bring it before the Conference of Colonial Premiers, though he recognised its importance.

The question of the Chamber providing a scholarship at the Birmingham University came up for consideration. The President said that when Professor Ashley came over and met the Chamber he said he hoped Walsall would find a scholarship. He fancied he still expected a reply. The Dudley Chamber had promised a scholarship, and Wolverhampton wanted to know what Walsall were going to do. Wolverhampton would probably give one if Walsall did. It was a matter of £20 a year for three years, and the question was whether the Chamber or some individual member would care to give it. In that connection they had received a letter from the Governors of Queen Mary's School, informing them that as the school fees had been raised, the four six-guinea scholarships given by the Chamber did not quite cover the cost of tuition. The idea of giving a Birmingham scholarship would have to be considered in the light of the fact that they had promised scholarships to Queen Mary's School, and to the Science and Art Institute. For two years the chamber had given five scholarships to the Grammar School, one of eight guineas, and four of six guineas each. The letter from the Governors read as if they took it for granted that the scholarships were given *in perpetuo*, while as a matter of fact the Chamber only promised them for two years. He would like to hear some expressions of opinion. No remarks were offered, however, so the President said that as it was an important matter, in which they were really very much interested, he should propose that it be referred either to the Education Committee or the General Purposes Committee. Mr. T. A. Smith seconded, provided the General Purposes Committee was selected. The Education Committee would like to give both sets of scholarships, but it was a question of finance, and would have to come before the General Purposes Committee sooner or later. They had had large expenses lately, and he personally should not like the job of canvassing members to give more money. Mr. Lavender remarked that it ought to be clearly understood that the scholarships to Queen Mary's School were not given *in perpetuo*. The resolution was carried.

The General Purposes Committee reported that a letter had been sent to the telephone company with regard to the breakdown of their service last winter. The committee had admitted the difficulties to be met with under the present system of working, and urged that the wires should be placed underground. It emphasised the fact that people using the telephone certainly had a grievance against the company in not having had the use of their instruments for so long a period. No reply had been received to this.

The committee's report included three other matters—standardisation, halfpenny post, and imperial cable communication. The first two did not now need urgent attention, standardisation because there would be no autumnal meeting of the Associated Chambers, and the halfpenny post because of the probability of an early change in the postmaster-generalship. It was decided that both these should be put back for the formulation of proposals on them, in time for presentation at the March meeting of the Associated Chambers in London. The President said that nothing had been done concerning imperial cable communication. The vastness of the subject had rather staggered the committee.

COLONIES.

Cape Colony (Cape Town).—At the annual meeting held on 7th April last, the President, Mr. J. W. JAGGER, in concluding his address, in moving the adoption of the report, said that the "only solid basis for the prosperity of any country is increased production; here almost every item, except, perhaps, diamonds, has fallen off during the last two years, and gold, the backbone of the South African trade, has fallen to less than one-twelfth of what it was in 1898. Hence the expenditure of Imperial money has not only made good the deficiency in our production, but has stimulated an abnormal growth of trade. The expenditure has been fairly well spread, but has particularly benefited the wage-earning classes of the population. Cape Town has benefited more than any other town in South Africa.

"I need hardly point out that this expenditure cannot last; the war is surely, if slowly, drawing to a close, and with that close, the Imperial expenses will, of course, be very largely cut down. A number of the regular troops will be withdrawn, and all the irregular corps, which are the most highly paid, will either go back to their own homes over the sea, or be disbanded. Further, the very large staff connected with the administration of the military affairs will also be reduced to a minimum. We shall then be thrown back on our own resources, and in this connection I may point out that our means of production in the shape of sheep, cattle, and horses have been very considerably decreased, and the cost of labour has been considerably increased. It will, therefore, take the colony a few years before its agricultural production equals that of 1898. Of course, I am well aware we are expecting, as soon as the war is over, a large influx of population and capital, and this will undoubtedly go some way towards mitigating the results of the stoppage of Imperial expenditure which I have indicated, but I need hardly point out that a large proportion of this capital and population is destined for the new colonies, particularly the Transvaal.

"I am, therefore, forced to the conviction that, with the conclusion of the war—though the trade of Port Elizabeth and East London must go ahead, seeing that a large part of their business is with the Transvaal and the Orange River Colony—the trade of Cape Town will have to face a set-back. I do not see how it is possible, thrown back, as I have said, on our own local resources and the resources of the country within 400 miles of Cape Town—for our transit trade is not worth reckoning—to sustain a local import trade of over £9,000,000, when the same trade in the last normal year (1898) was only about £5,000,000, and that, at the time, was a record, and the colony was fairly prosperous. Of course, I have no doubt but that in a few years our trade will recover itself, and even go to higher figures, but that can only take place with the increased development of the resources of South Africa, and, fortunately for us, Cape Town always benefits in some degree from the prosperity of any part of the sub-continent. The only thing that, in my opinion, could seriously interfere with its position in that respect would be the construction of a line from the West Coast across to the Transvaal. With the conclusion of the war, it behoves us to bend our whole attention and energies to developing the resources of our colony, if we are going to keep it in its old position of the premier colony of South Africa.

"There will, I believe, be no lack of energy and capital to develop the Transvaal and the Orange River Colony. It is anticipated that, within five years from now, there will be 17,000 stamps running on the Rand, turning out gold to the

value of 50 to 60 millions per year, and with that will doubtless go the development of the coal industry, and, possibly, iron and copper. It is also the intention of the Imperial Government to spend a large sum of money in the construction of railways in those territories. Hence, in the Cape Colony, which, so far, does not appear rich in minerals, other than diamonds, copper, and coal, it should, I think, be our policy to vigorously and systematically develop our agricultural resources, in order to take full advantage of the splendid markets which the North will offer. We have recently had an irrigation survey of the colony by a most competent irrigation engineer, and opportunities for development in that direction, on a much larger scale than ever thought of before in South Africa, have been pointed out. The policy of constructing light railways, recently sanctioned by Parliament, should be continued, and still further extended. The general and technical education of our people, which latter has hitherto only been done in a spasmodic sort of way, and on a small scale, should be systematically taken in hand, and immigration, for the purpose of getting new blood on the land, encouraged in every possible manner. Only by a policy such as this, vigorously pursued, can we hope to escape the fate of having to take the second, or even the third place, amongst the colonies of South Africa."

GENERAL INTELLIGENCE OF THE PAST MONTH.

August, 1902.

UNITED KINGDOM.

AUG. 1st: The King continued to make satisfactory progress, and went for a short cruise in the Royal Yacht. The Prince of Wales returned to London. Mr. Chamberlain and Lord Kitchener were presented with the freedom of the Grocers' Company. Mr. Shackleton (Labour) was returned unopposed as M.P. for Clitheroe. Death of Lieut.-Gen. Sir E. Newdigate-Newdegate.

2nd: The King held an Investiture on board the Royal Yacht. Ex-president Steyn, with his wife and family, arrived at Southampton, *en route* to Holland. Mr. Rudyard Kipling opened a rifle-range at Lower Sydenham.

4th: August Bank Holiday was observed. Yeomanry from South Africa landed at Southampton. Death of Sir Edward Hertslet, late Librarian at the Foreign Office. The Ancient Order of Foresters opened their High Court at Barrow. Death of Judge French.

5th: The Colonial Conference held its eighth meeting. The Earl of March was appointed Lord Lieutenant of Elgin in the room of the Duke of Fife, resigned. Lord Kitchener visited the Welbeck tenants' agricultural show. Death of Miss R. Davenport-Hill.

6th: The King left Cowes for London. Lords Roberts and Kitchener were presented with addresses and plate by the City of London Corporation. The Rt. Rev. Dr. Maguire was appointed by the Pope Roman Catholic Archbishop of Glasgow. The Sanitary Inspectors' Association opened their annual meeting at Middlesbrough. The House of Commons passed the second reading of the Appropriation Bill.

7th: Lord James of Hereford, acting upon medical advice, resigned the Chancellorship of the Duchy of Lancaster.

8th: The King received Ras Makonnen and the Prime Minister of Uganda at Buckingham Palace. The Queen presided at the Annual Meeting of the Soldiers' and Sailors' Families Association. Lord Dudley was appointed Lord Lieutenant of Ireland; Lord Londonderry, President of the Board of Education; Mr. C. T. Ritchie, M.P., Chancellor of the Exchequer; Mr. Akers Douglas, M.P., Home Secretary; and Mr. J. Austen Chamberlain, Postmaster-General. Death of the Hon. Arthur Webster.

9th: The CORONATION of the King and Queen took place in Westminster Abbey: Illuminations and great rejoicings in all parts of the Empire. The King offered to present Osborne House to the nation. A meeting of the Irish Parliamentary party was held in Dublin. The resignation of Dean Bradley was announced. Death of Major-Gen. K. G. Henderson.

11th: The King received in audience the Lord Mayor, Lord Duncannon, and Sir S. Crossley, M.P., who presented the Coronation Gift of £115,000. The Colonial Conference held its tenth and concluding meeting, Mr. Chamberlain presiding.

12th: The King reviewed the Colonial troops at Buckingham Palace. Lord Salisbury left London for Homburg. The Indian troops visited Westminster Abbey. Sir G. G. Stokes was elected Master of Pembroke College, Cambridge. Lord Cadogan took his official departure from Ireland.

13th: The King reviewed the Indian contingents at Buckingham Palace. Westminster Abbey was opened to the public. Mr. C. Wason, M.P. for Orkney and Shetland, applied for the Chiltern Hundreds.

14th: Lord Raglan was appointed Governor of the Isle of Man. The King and Queen left London for Cowes. Sir E. Barton and Mr. Seddon were entertained at a banquet at Tunbridge Wells. Death of Captain J. G. Malcolmson, V.C., M.V.O.

15th: The King placed a brass cross on the deck of the yacht *Alberta* as a memorial of Queen Victoria. The Indian troops left Hampton Court for Southampton, *en route* for India. Mr. Austen Chamberlain was re-elected unopposed. Death of Viscount Gort.

16th: The Coronation Naval Review was held at Spithead. The Shah of Persia arrived at Dover, and was received by Prince Arthur of Connaught. The Boer Generals, Botha, De Wet, and Delarey, arrived at Southampton, and were met by Mr. Fischer.

17th: The King received the Boer Generals on board the Royal Yacht. The Colonial troops attended a special service in Westminster Abbey.

18th: The King inspected the Fleet. The Shah arrived in London, and was welcomed by the Prince of Wales. The Boer Generals left London for Holland. Mr. T. Sloan (Independent Protestant) was returned as M.P. for South Belfast.

19th: The Shah was presented with an address by the Indo-European Telegraph Company. The Shah held a reception of the Diplomatic Corps in London. The Report of the Joint Select Committee on the Housing of the Working Classes was issued.

20th: The Shah visited the King on board the Royal Yacht. The King granted a Charter for the incorporation of the British Academy. The Labour Association opened its annual exhibition at the Crystal Palace. Sir E. Barton and Sir John Forrest left Liverpool for New York.

21st: The King and Queen visited Osborne, and afterwards set out for a cruise round Great Britain. The Shah received a deputation of Parsees at Marlborough House, and visited Sir H. Maxim's Works at Westminster. The Labour Association held its annual meeting at the Crystal Palace. The Institute of Public Health opened its annual conference at Exeter.

22nd: The King arrived at Milford Haven. The Shah was present at a review at Woolwich. The Maharajah of Jaipur left Dover for India. Mr. H. W. Forster (C.) was elected M.P. for Sevenoaks. Death of Sir Thomas Boyd. The Hugh Miller Centenary was celebrated at Cromarty.

23rd: The King and Queen visited Pembroke Castle. The Shah went to Windsor, and afterwards visited the Crystal Palace. General Sir George White opened the Gordon Highlanders' Memorial Institution at Aberdeen. The National Co-operative Festival took place at the Crystal Palace.

25th: The King and Queen landed at Ramsey and visited Peel and Douglas. The Shah left London for the Continent. Major E. F. Wodehouse was appointed Assistant Commissioner of the Metropolitan Police. The Institute of Public Health continued its conference at Exeter. Death of Major-General Alexander Jenkins.

26th: The King and Queen and Princess Victoria visited Arran. Lord Roberts and General Sir J. French were presented with the freedom of Canterbury. The Dublin Horse Show was opened at Ballsbridge. Death of Sir Campbell Clarke.

27th: Death of Major-General Sir J. M. Heriot-Maitland. Mr. A. B. Markham, M.P., addressed a letter of apology to Messrs. Wernher, Beit & Co. Lord Roberts visited Shorncliffe Camp.

28th: The King and Queen arrived at Colonsay in the Royal Yacht. Princess Henry of Battenberg opened a recreation ground at Newport. Lord Roberts was presented with the freedom of the borough of Dover. Death of Mr. James Craig. Death of the Rev. Dr. Angus.

29th: Ras Makonnen was appointed K.C.M.G. The Irish Landowners' Convention held their annual meeting in Dublin. A Charter of Incorporation was granted to the Carnegie Trust for the Universities of Scotland. The Smallpox epidemic ceased in London.

COLONIES.

Australia.—9th: The Coronation celebrations were enthusiastically carried out. 14th: The Federal House of Representatives rejected the Senate's suggested alterations of the Tariff. **New South Wales.**—1st: A serious colliery accident occurred at Wollongong. The Women's Franchise Bill passed both Houses. **Victoria.**—6th: The Financial Statement of Mr. Shiel, the Treasurer, was issued, and anticipated a deficit for 1902-3 of £650,000. 13th: The railway men threatened to strike if retrenchments were made by the Parliament. 16th: At the request of the Premier the railway men withdrew their threat. **South Australia.**—14th: Mr. R. Butler, State Treasurer, delivered his Budget speech announcing a deficit of £239,000. **Tasmania.**—1st: The Lewis Government secured a majority on a want of confidence motion in Parliament. 14th: The Ministers' reform proposals were shelved.

New Zealand.—6th: The Government promised to appoint a Committee of Enquiry into the treatment of Colonial troops on board the transport *Britannia*. 7th: The Loan Bill of £1,750,000 was passed.

Canada.—6th: Lord Dundonald unveiled a monument to Ottawa soldiers of the South African contingents. 9th: Coronation Day was loyally observed. 13th: The Canadian Manufacturers' Association held its annual session at Halifax. 15th: It was arranged that the first vessel of the direct Canadian service to South Africa should sail from Montreal on October 18th. 23rd: Death of the Hon. Joseph Royal. 28th: It was reported that the colony of the Dukhobors, in Manitoba, was in danger of being broken up.

Cape Colony.—5th: Mr. Rhodes' will was proved in Cape Town. 9th: The Coronation of King Edward was celebrated with great rejoicings. Mr. T. R. Price was appointed General Manager of the Central South African Railways. 13th: The first *train-de-luxe* from Bulawayo arrived at Cape Town, after 74 hours' journey. 20th: Parliament was opened. 23rd: The Parliamentary Indemnity Bill was read a second time. 26th: In the House of Assembly, Dr. Smartt strongly opposed the proposed Colonial Commission. 29th: The Indemnity Bill was read a second time in the House of Assembly. The loyal Dutch held a conference at Paarl.

Natal.—1st: The Press censorship was removed. Good progress was made in the construction of the Cape-Natal railway. 2nd: The Scottish Horse left Durban for Southampton. 15th: The work of repatriating the Boers progressed satisfactorily. 26th: Large numbers of Boer prisoners arrived at Durban, and were sent up country.

Newfoundland.—10th: The Labrador fishery was reported to be above the average. Sir Sandford Fleming withdrew from the arbitration regarding Mr. Reid's claim.

Rhodesia.—15th: Further discoveries were made in the great ruins at Zimbabwe.

Transvaal.—1st: The scheme for promoting the immigration of women to South Africa was taken over by the Government. The scarcity of native labour became a serious question. 4th: Advocates Smuts, Jacobs, and De Wet were admitted to practice in the Supreme Court. 7th: The Native Labour Association made good progress in supplying natives for the Rand industries. 15th: Education was extended: 689 schools were established. 19th: Lord Milner returned to Johannesburg from Lorenzo Marques. 26th: Progress was made in the organization of the Supreme Court and other Courts of the Colony, and in the drawing up of the penal code.

West Indies.—2nd: Quarantine was imposed at all ports on arrivals from Barbados.

INDIA.

7th: The Viceroy arrived at Mysore. 8th: The Viceroy presided at the investiture of the Maharajah. The total number of persons on famine relief was 386,000. The rectification of the India and Tibet frontier was completed. 25th: The total number on famine relief was 502,000. 28th: The construction of the Quetta-Nushki railway, which will be 82 miles long, and will cost 70 lakhs of rupees, was sanctioned. 29th: Mr. H. S. Barnes was appointed Lieutenant-Governor of Burma in succession to Sir P. W. Fryer, whose term of office will expire early next year.

FOREIGN COUNTRIES.

Abyssinia.—7th: It was reported that the Emperor had decided to make a tour of Europe.

Afghanistan.—4th: The relations between the Ameer and the Indian Government continued to be most amicable.

Austria-Hungary.—2nd: The King and Queen of Roumania arrived at Vienna. 3rd: The King of Roumania visited the Emperor at Ischl. 15th: The negotiations for the renewal of the *Ausgleich* were delayed. 21st: The conferences on the *Ausgleich* commenced. 26th: Mr. A. J. Herbert was appointed British Consul-General at Budapest. Lord Acton arrived in Vienna.

Belgium.—6th: The International Congress for improving the condition of the Blind was opened at Brussels. 7th: The Boer General Lucas Meyer died suddenly at Brussels. 20th:

The resignation of Baron Surmont de Volsberghe, Minister of Industry, was announced. 25th: The International Congress of Commerce and Industry was opened at Ostend.

Chile.—12th: The treaties with the Argentine were approved by the Chamber of Deputies.

China.—1st: Ching-ting-ping, leader of the rebels in Southern Chili was executed by General Li. 6th: The Viceroy of Sze-chuan was removed, and replaced by Tsen Chun-hsuan. 11th: France consented to the return of the Peking-Tien-tsin-Shan-hai-Kwan railway to the Chinese civil administration. 15th: The transfer of Tien-tsin was completed. 16th: The protocol tariff was signed by the representatives of the Powers. 25th: The Government sanctioned the signature of the new tariff, but proposed to delay the date for its coming into force. 29th: The British treaty negotiations were satisfactorily concluded. The protocol tariff was signed by the Chinese Commissioners.

Columbia.—1st: Severe fighting took place between General Herrera's forces and the Government troops. 6th: Generals Lacroix and Vidal, and Colonel Lecama were shot at Barrigone Camp.

Cuba.—4th: The House of Representatives passed a Bill authorising a loan of \$4,000,000 at 5 per cent. 6th: The Senate passed the Loan Bill.

Egypt.—5th: It was officially stated that this year's Nile flood would probably be the lowest on record. 7th: Cholera broke out in Alexandria. 25th: 388 cases of Cholera were reported.

France.—3rd: A statue of Pasteur was unveiled at Dôle, his birthplace. A consulting Committee for the Defence of the Colonies was formed. The decree against unauthorised Catholic establishments was issued. 4th: A number of provincial Catholic schools were closed. M. Henri Deutsch was killed in a motor-car accident. Great resistance was made to the closing of the Catholic schools, especially in Brittany. 11th: The decree for closing the schools continued to be enforced. 12th: Col. de St. Remy was tried by court-martial for refusing to carry out the order. 21st: Sir Wilfrid Laurier visited the seminary of St. Sulpice, Paris. 23rd: A statue of Joan of Arc was unveiled at St. Pierre-le-Moutier. 25th: The Shah arrived in Paris. The Siamese Minister visited M. Delcassé. 26th: Sir W. Laurier took lunch with President Loubet at Rambouillet. Many arrests were made of persons opposing the closing of the schools. 28th: The Shah visited President Loubet at Rambouillet.

Germany.—4th: The Emperor and Empress left Kiel for Reval to meet the Tsar. 8th: The death of Herr Rudolph von Bennigsen was announced. 11th: The Tariff Committee completed the first reading of the Tariff Bill. 17th: A meeting of 2,000 Poles was held in Berlin to protest against the Polish policy of the Government. 19th: A statue of the late Empress Frederick was unveiled at Homburg. 27th: The King of Italy arrived at Potsdam on a visit to the Emperor. 28th: The King of Italy, in company with the Emperor William, visited Berlin.

Holland.—3rd: Mr. Steyn and his family arrived at Scheveningen. 4th: General Lucas Meyer arrived at the Hague. 6th: Mr. Kruger visited Mr. Steyn. 7th: Mr. Kruger visited the pro-Boer exhibition at the Hague. 12th: Mr. Kruger returned to Utrecht. 19th: The Boer Generals arrived at the Hague. 26th: It was stated that 2,000,000 florins had been collected for the Boers, of which 450,000 florins remained for distribution. The Hague Arbitration Tribunal was directed to meet to judge its first case—a difference between the United States and Mexico. 28th: The Boer Generals denied having any differences with Mr. Kruger. Mr. Steyn's health was greatly improved.

Italy.—5th: The King contributed 100,000 lire to the fund for restoring the Campanile at Venice.

Japan.—21st: The general elections resulted in the return of 192 members of the *Seiyu-Kai*, 104 Progressives, 20 Imperialists, and 59 Independents. 28th: The protocol providing for arbitration on the question of the recently-imposed house tax was signed at Tokio.

Martinique.—26th: Fresh disturbances of Mont Pelée were reported.

Peru.—2nd: The Cabinet decided to resign. 10th: A new Ministry was formed with Señor de Ustua as Premier and Minister for Home Affairs.

Portugal.—4th: An earthquake was felt at Leiria.

Russia.—6th: The German Emperor arrived at Reval and was met by the Tsar on board the *Standart*. 8th: The German Emperor left Reval. Count Lamsdorff and Count von Bülow held long consultations. 11th: An attempt was made at Kharkoff to assassinate the Governor, Prince Obolenski. 29th: The ceremony of the betrothal of Prince Nicholas of Greece to the Grand Duchess Hélène Vladimirovna took place in the great palace at Tsarskoe Selo.

Servia.—6th: The Senate adopted the Loan Bill by 28 votes to 7.

Spain.—5th: Señor Sagasta announced his intention to retire.

Turkey.—5th: The Iradé for the unification of the Ottoman Debt was officially communicated to the French Ambassador. The Armenian Patriarch tendered his resignation. 16th: The candidates proposed by the Porte for the Governorship of the Lebanon were rejected by the Powers. 18th: Fresh difficulties arose with regard to the unification of the Debt.

United States.—13th: It was stated that President Roosevelt would call an extra Session of Congress in November to consider a reciprocity treaty with Cuba.

Venezuela.—15th: The revolutionists captured Puerto Caballo. 25th: Germany, Great Britain and France protested against the blockade as ineffective. Carupano was re-occupied by the Government troops. 26th: Ciudad Bolivar was bombarded by the Government gunboats.

FORTHCOMING EVENTS.

UNITED KINGDOM.

Bath.—On the 10th the Lord Mayor of London will visit Bath and unveil a mural tablet to Queen Charlotte. On the 27th Lord Roberts will receive the freedom of the city, and unveil a mural tablet to Lord Clive.

Belfast.—The annual meeting of the BRITISH ASSOCIATION will begin on the 10th inst., at Belfast.

Birmingham.—The annual conference of the Institute of Journalists will open at Birmingham on the 1st inst.

Bristol.—The Bristol Musical Festival will be held on October 8, 9, 10, 11.

Cardiff.—The Cardiff Musical Festival will be held on October 8, 9, 10, 11.

Edinburgh.—On October 14, the Poet Laureate will deliver the annual inaugural address at the Edinburgh Philosophical Exhibition.

London.—On the 1st inst. the TRADE UNION CONGRESS will begin. On the 13th October, Lord Kitchener will dine with the members of the Naval and Military Club. (Chiswick). On the 18th inst. there will be a Coronation feast to 10,000 children in the Duke of Devonshire's meadow, Chiswick.

Manchester.—INTERNATIONAL INDUSTRIAL EXHIBITION. It is proposed to hold an international exhibition in Manchester in 1903, to show the world's latest inventions and progress in machinery, aerial navigation, education, photography, agriculture, mining industries, and the fine arts. On the 15th October, Mr. BALFOUR will open the new SCHOOL OF TECHNOLOGY.

Norwich.—The Norwich Musical Festival will be held on October 22, 23, 24.

Sheffield.—On the 30th inst. Lord Kitchener will visit Sheffield to be present at the Cutlers' Feast, and to receive the freedom of the city.

Southend-on-Sea.—On the 13th inst. Lady Warwick will open the new technical schools.

Winchester.—On the 9th October, Lord Roberts will receive the freedom of the City of Winchester.

Worcester.—The Musical Festival will take place on September 9, 10, 11, 12.

COLONIES.

South Africa.—INTERNATIONAL PEACE EXHIBITION IN 1904.—Arrangements have been in progress for a long time past, and are now rapidly approaching completion, for the holding of this large and important industrial exhibition in 1904 near Johannesburg, in the most central position in the whole of British South Africa, near the junction of all the railways from the ports of Cape Town, Port Elizabeth, East London, Durban, and Delagoa Bay, in the centre of trade, wealth and commerce, and where the great majority of the traders, miners, agriculturists and manufacturers from all parts of South, East, West and Central Africa will congregate for many years to come. In fact, it is the most valuable position for an exhibition, the centre of attraction for capitalists and visitors, offering unique opportunities for manufacturers and others desiring to extend their connections in these countries and to participate in the enormous trade development of the largest market in the world for every class of goods used by both civilised and uncivilised people.

The exhibition will include mining and agricultural machinery of every description, steam, electrical, and all kinds of motive powers, railways, tramways, industries of every description, art, sciences, etc. In this respect it will probably be more complete and representative than any previous exhibition, and the largest gold exhibition the world has ever seen. Agents are now in Johannesburg completing the local arrangements. Offices have been opened in Johannesburg and Pretoria. Full particulars may be obtained from the Secretary, 16, Coekspur-street, Pall-mall, London. The City offices will be shortly opened.

FOREIGN COUNTRIES.

Belgium (Brussels).—AN INTERNATIONAL CONGRESS OF SURGERY.—The Belgian Society of Surgery, whose annual congress will take place in Brussels from September 8 to 11, has decided, on the proposal of its chairman, Dr. Ch. Willems (Ghent), to invite the most eminent surgeons of all countries to take part in the congress, and to found an international society of surgery. A great number of eminent surgeons have already accepted the invitation.

Russia (Moscow).—AN EXHIBITION OF MODELS of the Modern Style of Architecture and Industrial Art will be held in Moscow from 1st/14th November, 1902, to the 1st/14th March, 1903. The exhibition will comprise:—(a) Plans and designs in architecture and industrial art. (b) Photographs of buildings and interior decorations. (c) Paintings and decorative sculptures. (d) Furniture, bronzes, tapestries, upholsterings, mosaics, embroideries, jewellery, etc. Copies reproducing the original in a changed form will be refused.

NAVAL AND MILITARY INTELLIGENCE.

NAVAL.

The *Undaunted*, cruiser, was commissioned at Devonport as seagoing tender to the *Cambridge* gunnery school ship.

The Admiralty having decided to raise Gibraltar to a flag officer's command, Rear-Admiral Sir W. A. D. Acland has been selected to take over the appointment on October 1.

Orders have been received for the new first-class cruiser *Hogue* to be commissioned at Devonport to take the place of the cruiser *Niobe* in the Channel Squadron.

Capt. R. H. J. Meister, R.M., has been appointed to the Marine Staff of the Naval Intelligence Department, dated July 28, 1902.

The *Dreadnought*, battleship, was commissioned on the 20th ult., as tender to the *Defiance*, torpedo school ship, at Devonport.

All newly-commissioned ships are in future to be painted grey, the hulls, funnels, masts, and boats being all of the same shade.

The *Isis*, cruiser, is to commission at Chatham on September 19 for service as seagoing tender to the *Britannia*, training ship for naval cadets at Dartmouth.

The *Psyche*, cruiser, recently returned from the North America and West Indies Station, is to be paid off on September 5 into the D Division of the Devonport Dockyard Reserve. The *Psyche* is to be refitted by a private firm.

Plans have been received at Portsmouth for a new battleship to be built at the dockyard. The vessel will be of the *King Edward VII.* type, but will embody several improvements designed by Mr. Philip Watts.

The *Isis*, cruiser, is to be commissioned at Chatham on September 16, with a crew provided by the Devonport depot, as sea-going tender to the *Britannia*, training ship for cadets at Dartmouth.

Major James H. Bor, C.M.G., R.M.A., Deputy-Assistant Adjutant-General, has been promoted to the rank of Lieutenant-Colonel by Brevet, under Order in Council of March 19, 1883, dated August 17, 1902.

The *Bacchante*, cruiser, which will commission at Chatham on November 25, is ordered to relieve the *Andromeda*, cruiser, Capt. C. G. F. M. Cradock, C.B., flagship of Rear-Admiral Sir B. W. Walker, commanding the Cruiser Division of the Mediterranean Fleet.

Orders have been issued by the Admiralty that the *Montagu*, battleship, which was laid down in November, 1899, is to be completed by March, 1903, when she will have been in hand

forty-one months. The *Queen* is to be completed by March, 1904, while the *King Edward* is to enter service in March, 1905.

Capt. the Hon. H. Tyrwhitt has been selected for the appointment of Private Secretary to the First Lord of the Admiralty, in succession to Rear-Admiral W. H. Fawkes, on his appointment to the command of the Cruiser Squadron in October next.

The *Medusa*, cruiser, which has been refitted by the Palmer Shipbuilding Company, arrived at Devonport yesterday from Jarroon-on-Tyne. She has been fitted with Durr boilers, and will be placed at the disposal of the Boiler Committee for a series of trials.

The deep-sea trials of Submarine No. 4, which were postponed owing to a slight mishap to her gasoline engine, have been successfully concluded in the Irish Sea. She was submerged to the depth of about 10 feet, and in this position travelled for about six miles. Afterwards she went through several evolutions on the surface with great celerity.

Submarine A1, the latest type of British submarine boat, was put to severe speed tests in the Barrow Docks. The new vessel easily maintained a speed of about 15 knots, and it is expected that this will be still improved upon. Experiments were again made with Submarine No. 4, which has been undergoing improvements. The trials were successful.

Reuter's Agency states that the subsidies which have been mentioned at the Colonial Conference as the proposed contributions from the Colonies to the Imperial Navy are:—Commonwealth of Australia, £200,000 per annum; Cape Colony, £50,000 per annum; New Zealand, £40,000 per annum; and Natal, £35,000 per annum. In the case of Canada no amount has yet been specified.

Some particulars of the new submarine vessels may be of interest. They are each of 120 tons displacement, and are 63 ft. in length by 11½ in. beam. Their radius of action at slow speed is about 400 miles, and they are capable of attaining a maximum speed of nine knots per hour upon the surface and a speed of from seven to eight knots per hour for a period of four hours continuously when they are submerged. They are also fitted with one torpedo discharging tube, which can expel torpedoes equally when the vessels are upon the surface, when their conning towers are just awash, and when their hulls are submerged. They are each supplied with two torpedoes 11 ft. 5 ins. in length, are fitted with gear for regulating their depth of submergence, and with automatic and hand-steering gear. Their motive power when working upon the surface is derived from gasoline engines of 160 horse-power, and from electric motors when submerged.

Austria-Hungary.—The *Militär-Zeitung*, of Vienna, states that the new Austrian battleship III. will be launched in the beginning of October, when she will receive the name of *Babenberg*. When finished she will form, with the *Habsburg* and *Arpad*, a division of modern vessels with the latest improvements in arms and armour. All the building material has been made in Austria. Her length between perpendiculars is 353 ft.; beam, 65 ft.; displacement, 8,340 tons; engines 11,900 horse-power; speed, 18½ knots. She will be armed with three 9.43-in. Krupp guns of 40 calibre and 1897 model, 12 5.9-in., two steel bronze 2.75-in., and 26 machine guns, four of the latter being of rifle calibre.

Germany.—*Ueberall* states that the form of the new German river gunboats for use in China has now been decided upon by the German Admiralty, and the first one ordered from the Schichau yards, Danzig. Her length is to be 188.64 ft.; beam, 31.44 ft.; draught, only 2 ft.; displacement, 170 tons. Her two engines will be supplied with steam by Thornycroft boilers, and will work two propellers, giving her a speed of 13 knots. Her radius of action at ten knots will be 1,000 miles. She will be built throughout of Siemens-Martin steel, and have a protection of nickel steel of 8 mm. (nearly one-third of an inch) round her sides, and 12 mm. (nearly half-an-inch) for her conning tower. She will be armed with one 3.45-in., one 1.96-in., and two machine guns. She will have one signal mast, one funnel, and a searchlight, and will carry three boats. Her complement will be 53 men.

The *Cologne Gazette* states that six new German torpedo-boats, G 108 to 113, have been building at the Germania yards, Kiel. One of them is now ready, and in her builder's trials she has made 28.8 knots, her engines developing 6,200 horse-power. The new boats are intended to maintain easily a speed of 26 knots with engines working at 5,000 horse-power. Each will have accommodation for 100 tons of coal, and with this be able to run 2,000 miles at 12 knots. The new boats differ from those already existing in the German navy in being twin-screwed and in other details of construction. They are much higher out of the water forward, the signal mast is abaft both funnels, and the bridge is in front of them. The length of each boat over all is 215 ft. 10½ in.; between perpendiculars, 207 ft. 7½ in.; beam, 22 ft.; draught, 8 ft. 10 in.; displacement, 350 tons; complement, 49 men; armament, three 1.96-in. guns and three revolving torpedo tubes, all on deck.

Russia.—According to the *Cronstadt Vestnik*, the torpedo-boats attached to the Baltic Fleet, and which are fitted at present with water-tube boilers heated by naphtha, are to revert to coal fuel, as experiments have shown that the use of coal has increased their speed from 19 knots to 21 knots. Some of the boats have been fitted already with engines to burn coal.

United States.—Eight battleships are under construction for the Navy of the United States, and now the designs for two additional ones provided for in the current estimates have been approved, and excellent vessels they will be. America is now building armoured ships faster than any other country. The new vessels are to be completed in 42 months; we take from 60 to 72. The new ships for which tenders are now being asked will displace 16,000 tons, will have a speed of 18 knots, and a maximum coal capacity of 2,200 tons. Their armament is their most surprising feature, apart from the large provision for fuel. Four 12-in. breech-loading guns will be carried in a couple of turrets, fore and aft, armoured with plates ranging from 8 in. to 12 in., with a roof 2½ in. thick. At each corner of the superstructure will be two 8-in. breech-loaders, eight in all, carried in four electrically-controlled, balanced, elliptical turrets from 6 in. to 6½ in. in thickness. There will also be twelve 7-in. guns in broadside on pedestal mounts behind 7-in. armour, each gun isolated by splinter bulkheads. The forward and after guns on each side will be arranged so as to fire right ahead and right astern respectively. Consequently the bow fire in chasing will comprise two 12-in., four 8-in., and two 7-in. weapons. Each vessel will also carry 20 1.4-pr. rapid-fire weapons and 30 small guns. Each battleship will have nearly 4,000 tons of armour and 945 tons of guns. It is provided that the amount of woodwork to be carried shall be reduced to a minimum, and all that is used above the protective deck is to be rendered fireproof. The interest in these details lies in a comparison with the ships of larger size—16,350 tons—which are being built in this country. They will have four 12-in., four 9.2 in., and ten 6-in., or six fewer pieces than the smaller American ships, while they will have apparently no advantage in armour or coal capacity. It will be noticed in extenuation that the British ships have 9.2-in. weapons in place of 8-in. at the corners of the superstructure, but they carry only four of these, and the American favour twice the number of the 8-in. calibre.

Lieutenant Davis, of the American navy, has produced a new armour-plate. The inventor asserts that the tests show that it is superior to Krupp's armour-plate, and it is believed that it will withstand the most effective armour-piercing shell. Lieutenant Davis claims that his new armour-plate is one-third lighter than other plates with the same resisting power, and that it can be manufactured at smaller cost and in less time.

MILITARY.

Colonel H. W. Smith-Rewse, R.E., has been appointed to command the School of Military Engineering at Chatham for three years.

Second Lieutenant G. L. Uniacke, 4th Battalion Royal Lancaster Regiment, has been appointed to the Northern Nigeria Regiment of the West African Frontier Force.

Major W. S. Nathan, R.E., Assistant Director of Railways in the Transvaal and Orange River Colonies, has been approved for Secretary of the Railway Board of Control in South Africa.

Lieut.-Colonel W. A. May, C.B., Royal Army Medical Corps, who has been serving in South Africa since the beginning of the war, has been appointed principal medical officer in Natal. Major R. Fanshawe, D.S.O., Oxfordshire Light Infantry, lately serving with a mobile column in South Africa, has been appointed D.A.A.G. on Salisbury Plain.

Major J. MacN. Walter, D.S.O., Devonshire Regiment, Press censor at Cape Town, has been appointed D.A.A.G. in Guernsey.

The Secretary for War has approved the appointment at the Herbert Hospital, Woolwich, and Netley Hospital, Southampton, of experts in clinical pathology. The necessary laboratory accommodation is to be provided.

Lieut.-Colonel Rowley Wynyard, Royal Garrison Artillery, has been selected for Commandant of the Royal Hibernian Military School, Dublin, to succeed Colonel H. Hall, who vacated the post on the 31st ult.

General Sir George White, V.C., has selected his son, Lieutenant J. R. White, D.S.O., 1st Gordon Highlanders, for A.D.C. on his staff as Governor of Gibraltar, *vice* Captain R. G. Hooper, D.S.O., 21st Lancers, who is rejoining his regiment.

The Secretary for War has approved the appointment of Lieut.-Colonel J. F. S. Gooday, Engineer and Railway Volunteer Staff Corps, and General Manager of the Great Eastern Railway, to serve on the Army Railway Council, succeeding Colonel Sir W. Pollitt, late General Manager of the Great Central Railway, who has resigned.

Lieut.-Colonel H. Charlesworth, C.M.G., Royal Army Medical Corps, now at Portsmouth, has been appointed to succeed Deputy Surg.-General W. G. Don at the dépôt of the London Recruiting District, and Lieut.-Colonel Latchford, retired, has been appointed Medical Officer in the Dublin Recruiting District.

The *Italia Militare e Marina* states that Austria-Hungary has at last decided upon the form of a new field howitzer. It is a 4.13-in. gun made of Thielers bronze, and has a length of 12 calibres. It fires a shell of 3.5 calibres in length, charged with a new explosive called ammonal, which is said to be more powerful than ecrasite, and a shrapnel. Six pieces will form a battery, and three batteries a group. One group will be attached to each army corps.

Viscount Kitchener will conduct the military manoeuvres at Delhi in December. General Egerton will command the northern army, with General More-Molyneux as chief of staff, General Locke Elliot commanding the cavalry division, and Generals Sir J. Wolfe Murray and J. Collins infantry division leaders. General Wodehouse will command the southern army, with Colonel Bromfield as chief of staff, Colonel M. Little in command of the cavalry, and General W. Hill the infantry, with General Sir James Willcocks and Colonel A. Pearson as brigadiers.

Navies of Principal Countries.—A parliamentary paper recently issued gives details of the ships built and building for the chief navies of the world. The following is a summary of the vessels built:—

	Battleships.	Coast Defence.	Cruisers.	Torpedo Vessels.	Torpedo-boat Destroyers.	Torpedo-boats.	Submarines.
Britain . . .	52	4	126	34	108	4	—
France . . .	28	15	46	15	10	5	12
Russia . . .	18	14	21	17	27	4	—
Germany . . .	25	11	38	2	3	3	—
Italy . . .	17	—	21	14	9	3	1
United States . . .	10	12	22	—	2	5	1
Japan . . .	7	2	33	1	14	3	—

American Coke in 1901.—Although there was an increase in the production of coke in the United States during 1901 as against the previous year, there was a distinct decrease in the value of the product. The annual report of the United States Geological Survey on the subject, made by Mr. Edward W. Parker, shows that, inclusive of the output from 1,165 retort or by-product ovens, the total quantity of coke made was 21,795,883 net tons, the value of which was \$44,445,923, as compared with 20,533,348 net tons, valued at \$47,443,331 in 1900, and 19,668,569 net tons, valued at \$34,670,417 in 1899. The increase in production in 1901, as compared with the preceding year, was 1,262,535 net tons, or 6.14 per cent. The value of the product, however, shows a decrease of \$2,997,408, or 6.3 per cent. The reporter states that at the close of 1900 there were 5,804 new ovens in course of construction, of which 1,096 were by-product ovens. Only 80 of these latter, however, were completed during last year, the increased production being almost wholly that of beehive ovens. At the close of 1901 there were 5,155 ovens in course of construction, of which 1,533, or 30 per cent., were by-product ovens. The production of by-product coke increased from 1,075,727 net tons in 1900 to 1,179,900 tons in 1901. The returns for 1900 show the number of coke-making establishments to have been 396, which number was increased last year to 423. The output of coke for last year was produced by 23 States, working a total of 64,001 ovens. The States which showed the largest increases in production during that year were Pennsylvania, whose total increase was 998,622 net tons, and Virginia, which had a gain of 221,974 net tons. Five States showed decreases in production, the principal losses being sustained by West Virginia and Tennessee, where the decreases were respectively 74,799 and 71,415 net tons. Since the year 1898, and including that year, Pennsylvania, West Virginia, Alabama, Virginia, and Colorado have been the five leading coke-producing States, and in the order of their names as placed.

STATISTICAL NOTES.

United Kingdom.—COAL AND IRON.—The following tables are taken from the MEMORANDUM on the Comparative Statistics of Population, Industry, and Commerce in the United Kingdom and some leading Foreign Countries, recently issued by the COMMERCIAL DEPARTMENT of the BOARD of TRADE:—

I.—AVERAGE ANNUAL PRODUCTION of COAL in the UNITED KINGDOM, FRANCE, GERMANY, and the UNITED STATES in tons *per head of the population* of the different countries respectively in the undermentioned periods:—

Average of Period.	United Kingdom.	France.	Germany.	United States.
1855-59	2'34	0'21	+	+
1860-64	2'91	0'27	0'44	+
1865-69	3'39	0'33	0'64	+
1870-74	3'79	0'43	0'79	1'09†
1875-79	3'97	0'46	0'91	1'17
1880-84	4'45	0'54	1'15	1'79
1885-89	4'51	0'56	1'32	2'04
1890-94	4'73	0'69	1'48	2'45
1895-99	5'07	0'78*	1'69	2'57

* Partly estimated. † Average for the three years 1870, 1873, and 1874. ‡ No information.

II.—ESTIMATED CONSUMPTION in the UNITED KINGDOM, FRANCE, GERMANY, and the UNITED STATES in tons *per head of the population* of the different countries respectively in the undermentioned years:—

Year.	United Kingdom.	France.	Germany.	United States.
1883	3'79	0'81	1'08	1'91
1884	3'65	0'78	1'10	1'94
1885	3'57	0'75	1'11	1'76
1886	3'50	0'74	1'11	1'75
1887	3'56	0'78	1'14	1'97
1888	3'67	0'81	1'12	2'20
1889	3'76	0'83	1'28	2'05
1890	3'81	0'91	1'30	2'23
1891	3'84	0'92	1'36	2'34
1892	3'74	0'92	1'30	2'43
1893	3'30	0'90	1'32	2'43
1894	3'75	0'95	1'35	2'22
1895	3'75	0'95	1'38	2'46
1896	3'82	0'98	1'47	2'41
1897	3'87	1'03	1'54	2'47
1898	3'83	1'06	1'58	2'65
1899	4'05	1'10	1'66	3'00
1900	4'08	1'19	1'77	3'08

III.—AVERAGE ANNUAL PRODUCTION of PIG IRON from the UNITED KINGDOM, FRANCE, GERMANY, and the UNITED STATES, in tons *per head of the population* of the different countries respectively in the undermentioned periods:—

Average of Period.	United Kingdom.	France.	Germany.	United States.
1855-59	0'13	0'02	*	0'02
1860-64	0'14	0'03	0'02	0'03
1865-69	0'16	0'03	0'03	0'03
1870-74	0'20	0'03	0'04	0'06
1875-79	0'19	0'04	0'05	0'05
1880-84	0'23	0'05	0'07	0'08
1885-89	0'21	0'04	0'08	0'11
1890-94	0'19	0'05	0'10	0'13
1895-99	0'22	0'06	0'13	0'15

* No information.

The table relating to consumption of coal, perhaps the most important of the three, shows that in both Germany and the United States, with populations increasing faster than that of the United Kingdom, the amount of the increase per head is greater than in the case of the United Kingdom, *i.e.*, comparing the annual averages for 1896-1900 with those for 1885-89. The increase per head in the case of the United States, indeed, is more than double that in the United Kingdom. "Nevertheless, the tables clearly show that we still occupy the foremost place under all three heads, when population is taken as the measure."

EXPORT TRADE.—The following Table is taken from the same Memorandum of the Board of Trade:—

COMPARISON of the ANNUAL EXPORTS of the UNDER-MENTIONED COUNTRIES of the last twenty-one years (in millions sterling):—

Year.	United Kingdom.	France.	Germany.	United States.
	Million £	Million £	Million £	Million £
1880	223	139	145	172
1881	234	142	149	184
1882	241	143	160	153
1883	240	138	164	168
1884	233	129	160	151
1885	213	124	143	151
1886	213	130	149	139
1887	222	130	157	146
1888	234	130	160	142
1889	249	148	158	152
1890	263	150	166	176
1891	247	143	159	182
1892	227	138	148	212
1893	218	129	155	173
1894	216	123	148	181
1895	226	135	166	165
1896	240	136	176	180
1897	234	144	176	215
1898	233	160	181	252
1899	255	166	202	251
1900	283	164	222	286

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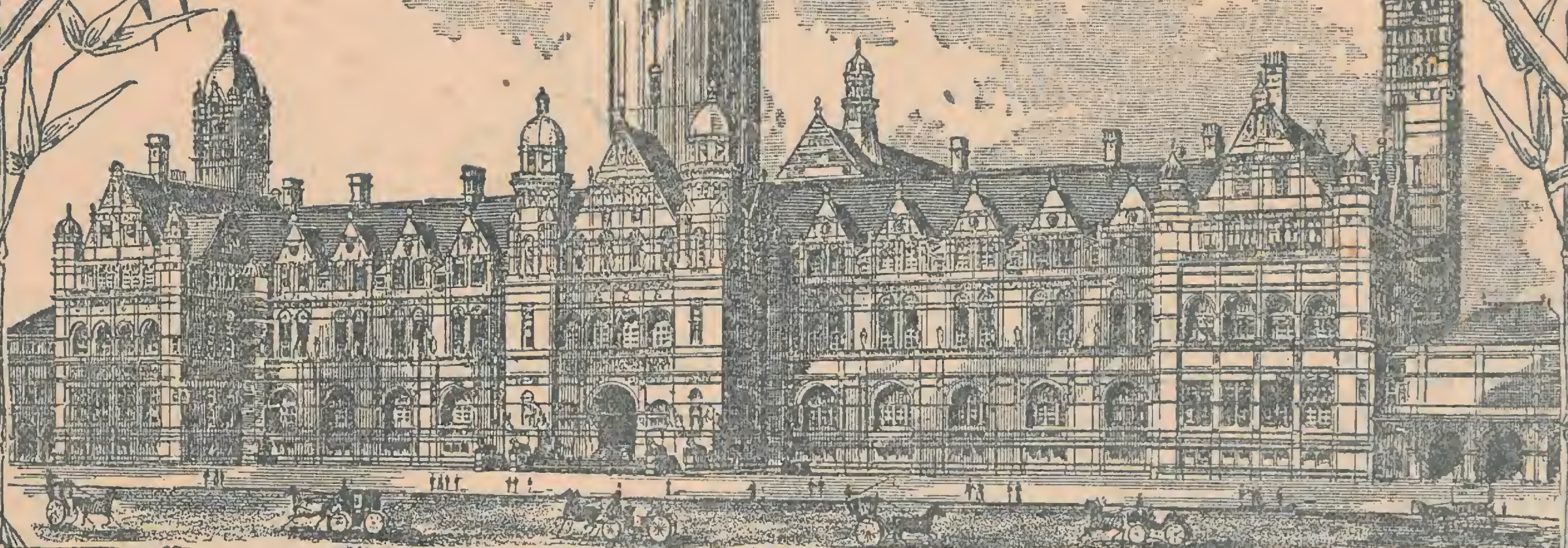
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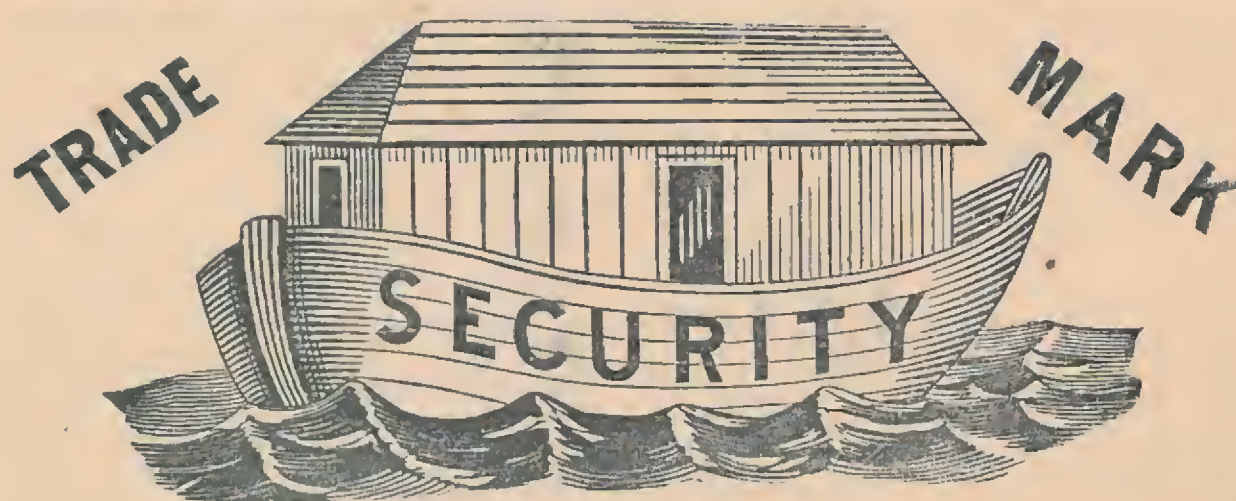
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[VACANT.]

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The Hon. SIR HORACE TOZER, K.C.M.G.

*Nominated by His Royal Highness the President.

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India.—See under BRITISH INDIA, on page 258.
Canada.—Quebec: THE COMMISSIONER OF AGRICULTURE.
Ontario: THE DIRECTOR OF MINES, Toronto.
New Brunswick: THE PROVINCIAL SECRETARY.
Manitoba: THE PROVINCIAL SECRETARY.
West Indies.—Jamaica: THE INSTITUTE OF JAMAICA.
Grenada: THE COLONIAL SECRETARY.
St. Vincent: THE ADMINISTRATOR.
St. Lucia: Mr. T. H. DIX.
Trinidad and Tobago: THE COLONIAL SECRETARY.
Bermuda: THE COLONIAL SECRETARY.

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Gold Coast.—[VACANT.]
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State of Johor.—The Dato JAMES MELDRUM.
Mauritius.—Mr. A. DARUTY DE GRANDPRÉ, Superintendent of the Museum.
Seychelles.—The Hon. E. B. SWEET-ESCOTT, C.M.G., Administrator.
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In the case of several Colonies correspondence is carried on through the Agent-General's Office or through the Representative Governor.

THE COMMERCIAL COLLECTIONS OF THE INSTITUTE.
BRITISH AFRICA.

(*West Central Lower Gallery.*)

CAPE COLONY.

Representative Governors.—Mr. THOMAS E. FULLER (Agent-General).

[ONE VACANCY.]

Corresponding Agent in Colony.—(At present through the Agent-General's Office).

Curator of Collection.—Mr. LEWIS ATKINSON.

Products Exhibited.—Agricultural produce, building stones, coal dried fruits, furs, minerals (including asbestos, gold-bearing quartz, copper ores, diamondiferous gravel, etc.), stuffed ostriches, ostrich eggs and feathers, Angora hair, tobacco, wines, wools, etc.

NATAL. (*West Central Lower Gallery.*)

Representative Governor.—SIR WALTER PEACE, K.C.M.G.

Corresponding Agent in Colony.—Mr. C. B. LLOYD, Commissioner of Agriculture and Mines, Natal.

Curator of Collection.—(In charge of Institute Staff.)

Products Exhibited.—Agricultural produce, Angora hair, tanning barks, building stones, coffee, cutlery, indigenous timbers, minerals, coal, silk cocoons, spirits, sugar, tea, tobaccos, wine, wools, native ornaments, etc., etc.

RHODESIA AND BECHUANALAND.

(*West Central Lower Gallery.*)

Representative Governors.—Those of CAPE COLONY.

Curator of Collection.—Mr. LEWIS ATKINSON.

Products Exhibited.—Specimens of native workmanship kindly lent by the late

[Queen Victoria.

NYASSALAND, BRITISH CENTRAL AFRICA.

(*West Central Lower Gallery.*)

Products Exhibited.—(By the British Central Africa Chamber of Agriculture and Commerce).—Coffee, ivory, *Landolphia* rubber, chillies, *Strophanthus* seeds, beeswax, photographs, etc.

BRITISH AMERICA.

(*West and Upper West Central Galleries.*)

DOMINION OF CANADA.

Representative Governor.—The Rt. Hon. the LORD STRATHCONA and MOUNT-ROYAL, G.C.M.G., High Commissioner for the Dominion of Canada.

Curator of Collections.—Mr. HARRISON WATSON.

PROVINCE OF QUEBEC.

Representative Governors.—The Rt. Hon. the LORD STRATHCONA and MOUNT-ROYAL, G.C.M.G., High Commissioner for the Dominion of Canada.

[ONE VACANCY.]

Corresponding Agent in Province.—The COMMISSIONER OF AGRICULTURE.

Products Exhibited.—Canadian furs from Hudson's Bay Co., stuffed birds, wood pulp, slates, vehicles, minerals (asbestos, apatite, mica, plumbago, etc.), agricultural produce, fruits, tobacco, maple sugar, timber, Indian ornamental work, cotton, linen, and leather, and iron manufactures.

THE COMMERCIAL COLLECTIONS OF THE INSTITUTE—*continued.*BRITISH AMERICA—*continued.*DOMINION OF CANADA—*continued.*

PROVINCE OF ONTARIO.

Representative Governors.—SIR HENRY TYLER and JOHN PATON, Esq.

Corresponding Agent in Province.—Mr. ARCHIBALD BLUE, Director of Mines, Toronto.

Products Exhibited.—Agricultural produce, preserved fruits, indigenous timbers, gold, silver, iron, lead, and nickel ores, petroleum, marble, granite and decorative stones, coal, native wines, honey, canned meats, and woodwork.

PROVINCE OF BRITISH COLUMBIA.

Representative Governor.—The Hon. J. H. TURNER (Agent-General).

Corresponding Agent in Province.—(At present through Agent-General's Office.)

Products Exhibited.—Agricultural produce, coal, Douglas fir and other timbers, minerals, preserved fruit, tinned salmon, fish oils, woodwork, birds, and animals.

PROVINCE OF NEW BRUNSWICK.

Representative Governor.—C. A. DUFF MILLER, Esq., Agent-General.

Corresponding Agent in Province.—The PROVINCIAL SECRETARY.

Products Exhibited.—Timbers, minerals, building stones.

PROVINCE OF MANITOBA.

Representative Governor.—The Rt. Hon. the LORD STRATHCONA and MOUNT-ROYAL, G.C.M.G.

Corresponding Agent in Province.—The PROVINCIAL SECRETARY.

Products Exhibited.—Agricultural produce (including barley, beans, corn, oats, peas, rye, wheat, flour, &c.); birds, comprising ducks, grouse, partridges, snipe, etc.; heads of wapiti, caribou, moose and other large game; specimens of native workmanship, photographs, head-dresses, clubs, arrows, beadwork, etc., etc.

PROVINCE OF NOVA SCOTIA.

Representative Governor.—JOHN HOWARD, Esq., Agent-General.

Corresponding Agent in Province.—(At present through Agent-General's Office.)

Products Exhibited.—Minerals, samples of iron ore and products manufactured from the ore, wood-wool.

NORTH-WEST TERRITORIES.

Representative Governor.—THOMAS SKINNER, Esq.

Corresponding Agent in Province.—(At present through the Representative Governor.)

Products Exhibited.—Grain.

NEWFOUNDLAND.

(Upper West Central Gallery.)

Representative Governor.—[VACANT.]

Corresponding Agent.—

Products Exhibited.—Minerals (including ores of iron, copper, manganese, chromium, lead, antimony and zinc, molybdenite, mispickel, mica, asbestos, steatite, granite, marble, slate, coal, and petroleum) and timber.

BERMUDA.

(Middle of Central Lower Gallery.)

Representative Governor.—Gen. SIR ROBERT BIDDULPH, G.C.B., G.C.M.G.

Corresponding Agent.—THE COLONIAL SECRETARY.

Products Exhibited.—Arrowroot, woods, silk, shell-work, and sandstone.

WEST INDIES.

(West Central Lower Gallery.)

BRITISH GUIANA, TRINIDAD, AND TOBAGO.

Representative Governor.—The Rt. Hon. the LORD STANMORE, G.C.M.G.

Corresponding Agent.—Trinidad and Tobago: THE COLONIAL SECRETARY.

Curator of Collection.—(In charge of Institute Staff.)

Products Exhibited.—Arrowroot, cereals and pulses, medicinal barks, cocoa, coral, coffee, indigenous timbers, lace, fibres, rum, spices, starches, sugars, timber, leather, skins, drugs, fish glue, basket-work, condiments, etc.

JAMAICA AND BAHAMAS, WINDWARD ISLANDS, AND BARBADOS.

Representative Governor.—Field Marshal SIR HENRY W. NORMAN, G.C.B., G.C.M.G.,

Corresponding Agent.—Jamaica: THE INSTITUTE OF JAMAICA. [C.I.E.]

Hon. Curator.—[VACANT.]

Products Exhibited.—Arrowroot, barks, cocoa, coral, coffee, indigenous timbers, lace-bark, fibres, rum, spices, starches, sugars, sarsaparilla, wax, oils, condiments, turtle, etc.

BRITISH HONDURAS.

Representative Governor.—J. McMURRICH CURRIE, Esq.

Corresponding Agent.—[VACANT.] *Hon. Curator of Collection.*—J. M. CURRIE, Esq.

Products Exhibited.—Banana and cassava meal, cocoanut oil, coffee, horns (deer), indiarubber, Indian corn, medicinal barks, pickles, preserved fruits, rice, rope and cordage of native manufacture, rum, seeds edible and ornamental, spices, sponges, sugar, mahogany and other timbers, tobacco, etc.

LEEWARD ISLANDS.

Representative Governor.—[VACANT.]

Corresponding Agents.—Grenada: THE COLONIAL SECRETARY.

St. Vincent: THE ADMINISTRATOR.

St. Lucia: MR. T. H. DIX.

Products Exhibited.—Arrowroot, barks, cocoa, coral, coffee, indigenous timbers, fibres, rum, spices, starches, sugars, etc., etc.

FALKLAND ISLANDS. (Middle of Central Lower Gallery.)

Representative Governor.—Gen. SIR ROBERT BIDDULPH, G.C.B., G.C.M.G.

Corresponding Agent.—THE COLONIAL SECRETARY.

Products Exhibited.—Wool, birds' skins and eggs.

BRITISH AUSTRALASIA.

NEW SOUTH WALES.

(East Central Upper and Lower Galleries.)

Representative Governor.—The Hon. HENRY COPELAND (Agent-General).

Corresponding Agent in Colony.—(At present through Agent-General's Office.)

Products Exhibited.—Minerals (including gold, silver, coal, &c.), wool, indigenous timbers, wines, cereals, seeds, gums, resins, oils, fibres, rope, leather, tallow, etc., etc.

VICTORIA.

(East Central Upper and Lower Galleries.)

Representative Governors.—[VACANT.]

Corresponding Agents in Colony.—(At present through Agent-General's Office.)

Officer in Charge of Collection.—Mr. A. G. BERRY (of the Agent-General's Office.)

Products Exhibited.—Animals, birds, coal, cereals, chemical manufactures, cigars, essential oils, gums, grain, hops, indigenous timbers, leather, leatherware, minerals (including auriferous quartz, coal, kaolin, etc.), models of gold nuggets, seeds, sugar, tobacco, wines, wool, etc., etc.

SOUTH AUSTRALIA.

(East Central Lower Gallery.)

Representative Governors.—H. A. GRAINGER, Esq. (Agent-General), and HENRY BULL TEMPLAR STRANGWAYS, Esq.

Corresponding Agent in Colony.—(At present through Agent-General's Office.)

Officer in Charge of Collection.—Mr. EDMUND SNELL (of the Agent-General's Office.)

Products Exhibited.—Agricultural produce, wines, indigenous timbers, furniture, wool, etc.

QUEENSLAND (AND BRITISH NEW GUINEA).

(East Central Lower Gallery.)

Representative Governors.—The Hon. SIR HORACE TOZER, K.C.M.G. (Agent-General), and Field Marshal SIR HENRY W. NORMAN, G.C.B., G.C.M.G., C.I.E.

Corresponding Agent in Colony.—(At present through Agent-General's Office.)

Curator of Collection.—(In charge of Institute Staff.)

Products Exhibited.—Building stones, eucalyptus oils, fibres, minerals, pearl shells, indigenous woods, cereals, models of fruits, sugar, wine, tinned meats, hides, skins, leather, etc., etc.

WESTERN AUSTRALIA.

(East Central Lower Gallery.)

Representative Governor.—The Hon. H. B. LEFROY (Agent-General).

Corresponding Agent in Colony.—(At present through Agent-General's Office.)

Curator of Collection.—(In charge of Institute Staff.)

Products Exhibited.—Wools, gums and resins, olive oil, fibrous barks, silk, skins, indigenous woods, minerals, model gold ingots, etc., etc.

TASMANIA.

(East Central Lower Gallery.)

Representative Governor.—The Hon. ALFRED DOBSON (Agent-General).

Corresponding Agent in Colony.—Mr. T. C. JUST, Chief Secretary's Office, Hobart.

Curator of Collection.—(In charge of Institute Staff.)

Products Exhibited.—Cereals, minerals, models of fruits, stuffed fish, furs, timbers, illustrations of local manufactures, etc., etc.

NEW ZEALAND.

(East Central Lower Gallery.)

Representative Governors.—The Hon. W. P. REEVES (Agent-General), and THOMAS MACKENZIE, Esq. *Corresponding Agent in Colony.*—(At present through Agent-General's Office.)

Curator of Collection.—(In temporary charge of Institute Staff.)

Products Exhibited.—Agricultural produce, building stones, coal, Kauri gum, hemp and flax, tinned meats, wools, tobacco, Kauri and other woods, with illustrations of their application to structural and ornamental purposes; photographs, etc., etc.

FIJI.

(Middle of Central Lower Gallery.)

Representative Governor.—Gen. SIR ROBERT BIDDULPH, G.C.B., G.C.M.G.

Corresponding Agent in Colony.—Hon. JOHN HILL, Suva.

Curator of Collection.—(In charge of Institute Staff.)

Products Exhibited.—Barks, fibres, copra, tea, cocoa, coffee, timbers, etc.

BRITISH INDIA (AND ASIA).

INDIA

(East Gallery and Pavilion.)

Representative Governors.—Vide p. 256.

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Secretary: Mr. J. R. ROYLE, C.I.E.

Channel of Correspondence.—THE REVENUE AND AGRICULTURAL DEPARTMENT, INDIA.

Curator of Collection.—Mr. J. R. ROYLE, C.I.E.

Products Exhibited.—Fodder grasses, foods and food stuffs, sugar, spices and condiments, models of fruits, narcotics (including opium, ganja, etc.), tobacco and cigars, tea and coffee, oils and oil-seeds (including those of castor, sesamum, linseed, cocoa-nut and ground nut, etc.), a large assortment of drugs, dyes and tans, gums and resins (including the resins and turpentine of Indian pines, wax, lac, etc.), an extensive collection of fibres (including cotton, silk, jute, coir, rhea, agave, etc.), models illustrating the manufacture of cotton and jute, minerals (including building stones, coal, mica, soapstone, corundum, iron ores, steel, etc.), timbers, collection of Indian pottery, carved woodwork, silver, brass and copper ware, silk and cotton fabrics.

CEYLON.

(East Gallery.)

Representative Governor.—The Rt. Hon. the LORD STANMORE, G.C.M.G.

Executive Officer and Home Agent.—FREDK. H. M. CORBET, Esq., Barrister-at-Law.

Curator of Collection.—Mr. J. R. ROYLE, C.I.E.

Products Exhibited.—Cereals, pulses, edible fruits, roots and grains, spices and condiments, drugs, horns, skins, pearls, shells, wax, oils, gums, resins, dyes, tans, fibres, timbers, building stones, plumbago, metallic ores, rough gems, palm products, tea, coffee, cocoa, cinchona bark, sugar, tobacco, cotton-cloth, mats, rattan and basket work, wood and ivory carving, metal-work, pottery, tortoise-shell and porcupine quill work, lacquer work, lace, etc., etc.

STRAITS SETTLEMENTS (AND JOHOR).

(East Gallery.)

Representative Governor.—SIR CECIL CLEMENTI SMITH, G.C.M.G.

Corresponding Agents.—The COLONIAL SECRETARY (at Singapore); The Dato JAMES MELDRUM (for Johor). *Curator of Collections.*—(In charge of Institute Staff.)

Products Exhibited.—Barks, canes, drugs, fibres, preserved fruits (including Singapore pine-apples), mats, silk fabrics, oils and oil-seeds, dyes and tans, gums, gutta-percha, tin ores and other minerals, teas, coffee, spices, timbers, etc., etc.

MAURITIUS (AND SEYCHELLES).

(West Central Lower Gallery.)

Representative Governor.—[VACANT.]

Corresponding Agent in Colony.—Mr. A. DARUTY DE GRANDPRÉ, Museum Superintendent

Corresponding Agent for Seychelles.—The Hon. E. B. SWEET-ESCOTT, C.M.G., Administrator

Curator of Collection.—(In charge of Institute Staff.)

Products Exhibited.—Fibres, hemp, oils, rum, seeds, sugars, tortoise-shell, vanilla beans, with specimens of native workmanship, etc., etc.

HONG KONG.

(Middle of Central Lower Gallery.)

Representative Governor.—SIR WILLIAM ROBINSON, G.C.M.G.

Corresponding Agent in Colony.—The HARBOUR MASTER.

Curator of Collection.—(In charge of Institute Staff.)

Products Exhibited.—China, carved and inlaid ivory and wood-work, silver and lacquer ware, silk and cotton fabrics, drugs, paints, dyes, food stuffs, etc., etc.

BRITISH NORTH BORNEO.

(West Central Lower Gallery.)

Corresponding Agent.—(At present through the British North Borneo Co.)

Curator of Collections.—(In charge of Institute Staff.)

Products Exhibited.—Timbers, rattans, coal, rice, sago, sugarcane and raw sugar coffee, cocoa pods, pepper, tobacco, beeswax, camphor, gutta-percha, kapok fibre dammars, cutch and gambier, hemp, honey, etc.

BRITISH POSSESSIONS (EUROPE)

MALTA, GIBRALTAR, AND CYPRUS.

(West Central Gallery.)

Representative Governor.—Gen. SIR ROBERT BIDDULPH, G.C.B., G.C.M.G.

Corresponding Agent.—(At present through the Representative Governor.)

Curator of Collections.—(In charge of Institute Staff.)

Products Exhibited.—From Malta—Carved stone-work, lace, macaroni, honey, various fabrics, models, pictures, etc., etc. Gibraltar and Cyprus—None at present.

IMPERIAL INSTITUTE JOURNAL.

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GENERAL NOTICES.

"THE IMPERIAL INSTITUTE JOURNAL."

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The JOURNAL may also be purchased for **Sixpence** each copy at the Ticket Office of the Institute and at the railway book-stalls of Messrs. WILLING & CO.

The City Agents for the JOURNAL are Messrs. WILLING & CO., 17, Royal Exchange, London, E.C. It may also be obtained at the offices of the printers, WATERLOW & SONS LIMITED, Blomfield-house, London-wall, London, E.C.

Communications respecting Advertisements should be addressed to the ADVERTISEMENT MANAGER, 6, Arundel-street, Strand, London, W.C.

This JOURNAL is distributed (by post) throughout the United Kingdom, India, and the Colonies of the British Empire, and to the following Foreign Countries:—Argentina Republic, Austria-Hungary, Belgium, Bolivia, Chili, China, Colombia, Costa Rica, Denmark, Egypt, France, Germany, Greece, Hawaiian Islands, Holland, Italy, Japan, Mexico, Montenegro, Morocco, Norway, Persia, Peru, Portugal, Russia, Siam, Spain, Sweden, Switzerland, Tripoli, Turkey, United States of America, Uruguay, and Venezuela. The JOURNAL is also placed in the Reading Rooms of CHAMBERS OF COMMERCE, CLUBS, and HOTELS, both at home and abroad.

IMPORTANT NOTICE

TO

ANNUALLY PAYING FELLOWS.

The Bill transferring the property and Government of the Imperial Institute to the Nation has become Law.

After the 1st of January, 1903—when the Act comes into operation—subscribing Fellows will cease to exist as such.

It is suggested that any standing orders that may have been given to Bankers or Agents for the payment of the annual Fellow's subscription should be cancelled. A continuance of the enjoyment of privileges of Fellowship will be secured to those now on the Roll of Life Fellows of the Institute, but no new Life Fellows will be elected.

SPECIAL EXHIBITION OF COLONIAL PRODUCTS AND INDUSTRIES.

A Special Exhibition of Collections illustrative of the Mineral Wealth and of certain Industries of the DOMINION OF CANADA, also of commercial products from QUEENSLAND, RHODESIA, WESTERN AUSTRALIA, and BRITISH NORTH BORNEO, is on view in the western half of the North Gallery, from 11 a.m. to 5 p.m., on week-days—**Admission Free.**

FELLOWS' DEPARTMENT.

The Reading, Writing, and News Rooms, are open for the use of Fellows every week-day from 10 a.m. till 11.30 p.m., and on Sundays from 3 p.m. to 10.30 p.m. The Library (on the First Floor), is open from 10 a.m. to dusk on Week-days, and from 3 p.m. to dusk on Sundays. The Map Room (First Floor) is open from 10 a.m. to 5 p.m. on Week-days.

The Poste Restante is open every week-day for receipt and delivery of letters and parcels. Letters addressed to initials only are not received, except in reply to notices in the JOURNAL, under "Requirements" Registry. The General Post Office Pillar Box is cleared daily twelve times, between 10.10 a.m. and midnight. Light refreshments only are, for the present, provided in the Fellows' Rooms and at the bar of the Ceylon Kiosk.

EMIGRATION INFORMATION OFFICE.

The Office of the British Women's Emigration Association (*see page 274*), in the West Corridor, First Floor, is open daily from 10 a.m. to 4 p.m., and advice and information respecting emigration and openings in the Colonies may be obtained there free of charge. Enquiries of all kinds relating to the Colonies from intending Emigrants are dealt with in the Commercial Intelligence Department, and special information respecting Canada and the Cape Colony may also be obtained from the Curators for these Colonies, on application personally at their offices, or by letter.

"REQUIREMENTS" REGISTRY.

With the object of affording Fellows of the Imperial Institute, and the General Public resident in the United Kingdom, an opportunity of making known special "wants" or "needs" in the British Colonies, India, and Foreign Countries, space will be regularly devoted to *approved* notices in a column reserved for this purpose. Advertisers may have their replies addressed to them direct, *c/o the Imperial Institute, London, S.W.*, under a distinctive number and initials. The cost of postage will be charged for the transmission of replies delivered at the Institute. Residents in the Colonies and India, and Foreign Countries, can register in like manner. (*For further particulars see page 270*).

SCIENTIFIC AND TECHNICAL DEPARTMENT.

The Scientific and Technical Department of the Institute has been established to acquire information by special enquiries and by experimental research, technical trials and commercial valuation regarding new or little known natural or manufactured products of the various Colonies and Dependencies of the British Empire and of foreign countries, and also regarding known products procurable from new sources, and local products of manufacture which it is desired to export. This work is carried out with a view to the creation of new openings in trade, or the promotion of industrial developments.

In the extensive and well-equipped series of Research Laboratories occupying the West Corridor of the Second Floor, a staff of skilled Chemists, under the direction of Professor Wyndham R. Dunstan, M.A., F.R.S., carry out the investigation of the chemical constitution and properties of new dye-stuffs, tanning materials, seeds and food-stuffs, oils, gums and resins, fibres, timbers, medicinal plants and products; animal products, minerals and ores, soils, cements, and various other products, with a view to their commercial utilization. Whenever necessary these materials are submitted to special scientific experts, by whom they are made the subjects of particular investigation or practical tests. Reports are also obtained from technical or trade-experts in regard to the probable commercial or industrial value of any such products, whilst full information is collected from official or other trustworthy sources regarding the probable extent and cost of available supplies. All materials requiring scientific or technical examination, or commercial valuation, should be submitted to the Institute for examination either by, or through the Foreign Office, the Colonial Office, the India Office, or the Board of Trade, or through the Colonial or Indian Government Authorities. Requests for the examination of such materials may also be submitted by Public Commercial Bodies and Institutions of the respective Colonies and Dependencies, or by the Representatives of H.M. Government in foreign countries.

COMMERCIAL COLLECTIONS.

The Galleries containing the Colonial and Indian Collections, and the Public Commercial and Industrial News Room, are open for free inspection by the public daily, *except Sundays, and any days specially notified*, from 11 a.m. until 5 p.m. Every information concerning the products, their supply, etc., can be obtained on application to the Curators of the Indian and Ceylon, Canadian, and South African Sections, to the general Curator, and to the Commercial Intelligence Department.

COMMERCIAL INTELLIGENCE DEPARTMENT.

The Office of this Department, in the West Corridor, First Floor, is open daily from 10 a.m. to 5 p.m. (on Saturdays till 1 p.m.), for the purpose of answering enquiries and supplying information relating to the Commerce (Export and Import) and Industries of India and the Colonies. Applications may be made personally or by letter. Special information may be obtained from the Curators in charge of the Indian and of certain Colonial Collections. Arrangements have been made for the translation for mercantile firms of Trade Circulars, Price-Lists, and Catalogues into any Foreign Language, including the conversion of weights, measures and coinages, etc., at cost price, and application for such may be addressed to this Department.

CITY BRANCH OF THE IMPERIAL INSTITUTE.

REMOVAL TO 49, EASTCHEAP, E.C.

The City Enquiry Office and Reading Room have been removed from 112, Cannon-street to larger premises at 49, EASTCHEAP, where a commodious apartment is also provided for the display, to merchants, manufacturers, etc., of raw and manufactured products received, from time to time, from the Colonies and from India, and for which it is desired to find openings in British markets. General commercial information is supplied to enquirers at all times.

A representative for INDIA attends on Tuesday, Wednesday, and Thursday mornings.

A representative for the DOMINION OF CANADA attends daily by appointment.

A representative for QUEENSLAND attends daily from 10 a.m. to 1 p.m.

The Commercial Agent for the NEW SOUTH WALES Government attends daily from 10 a.m. to 5 p.m.

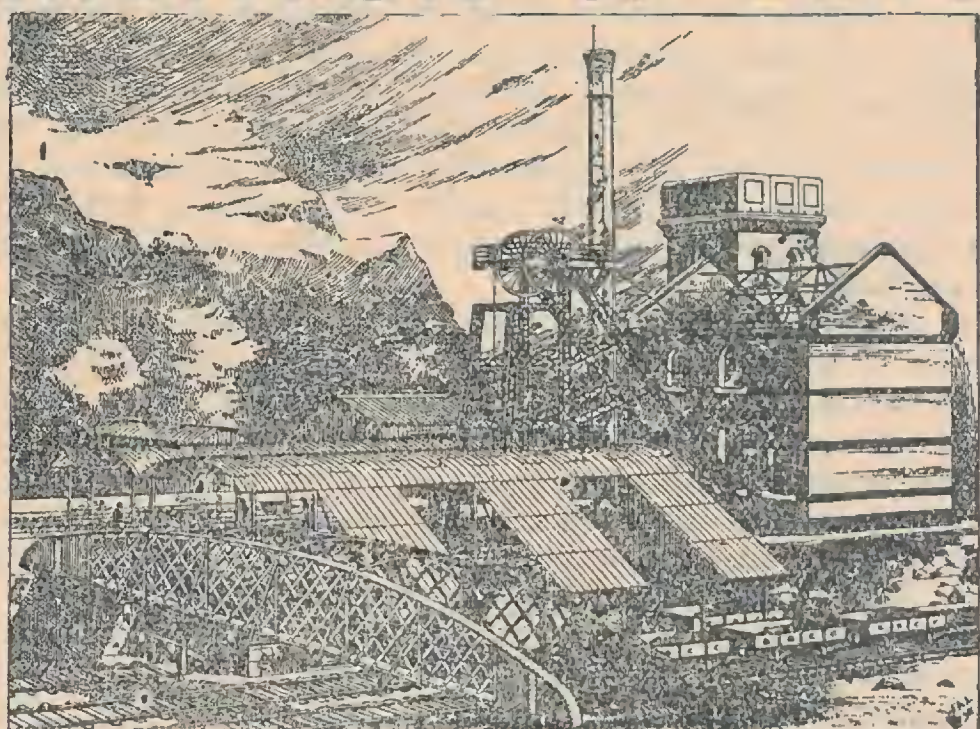
Colonial and Indian newspapers, directories, reports, statistics, and other books of reference may be consulted by the general public. (*For further information see page 272*).

THE NORTHBROOK SOCIETY.

The Northbrook Society is affiliated to the Imperial Institute, and has a special room allotted for the exclusive use of its members in the Institute buildings. Its primary objects are to watch over and promote the interests of natives of India, and to provide a system of guardianship or supervision over such as are sent to Europe for education. The Society is controlled by a committee consisting of an equal number of Governors of the Imperial Institute and members of the Society, presided over by the Earl of Northbrook. It possesses an excellent library. Indian members, who pay no subscription to the Society, have the especial advantage of becoming Fellows of the Institute at half the usual subscription payable by the ordinary Fellows. Applications for membership of the Society should be addressed to the Secretary of the Northbrook Society, Imperial Institute, London, S.W.

IMPERIAL INSTITUTE JOURNAL.

An ornamental red Cloth Cover, for binding the numbers of the JOURNAL for the year 1901 into one volume, may be obtained at the TICKET OFFICE of the INSTITUTE, or from Messrs. WATERLOW AND SONS LIMITED, Blomfield-house, London-wall, E.C., price 2s. 6d. An index and title-page to the volume were inserted in the January issue of the JOURNAL. Bound yearly volumes of the JOURNAL, for the years 1895-1901, may be had at 10s. each.

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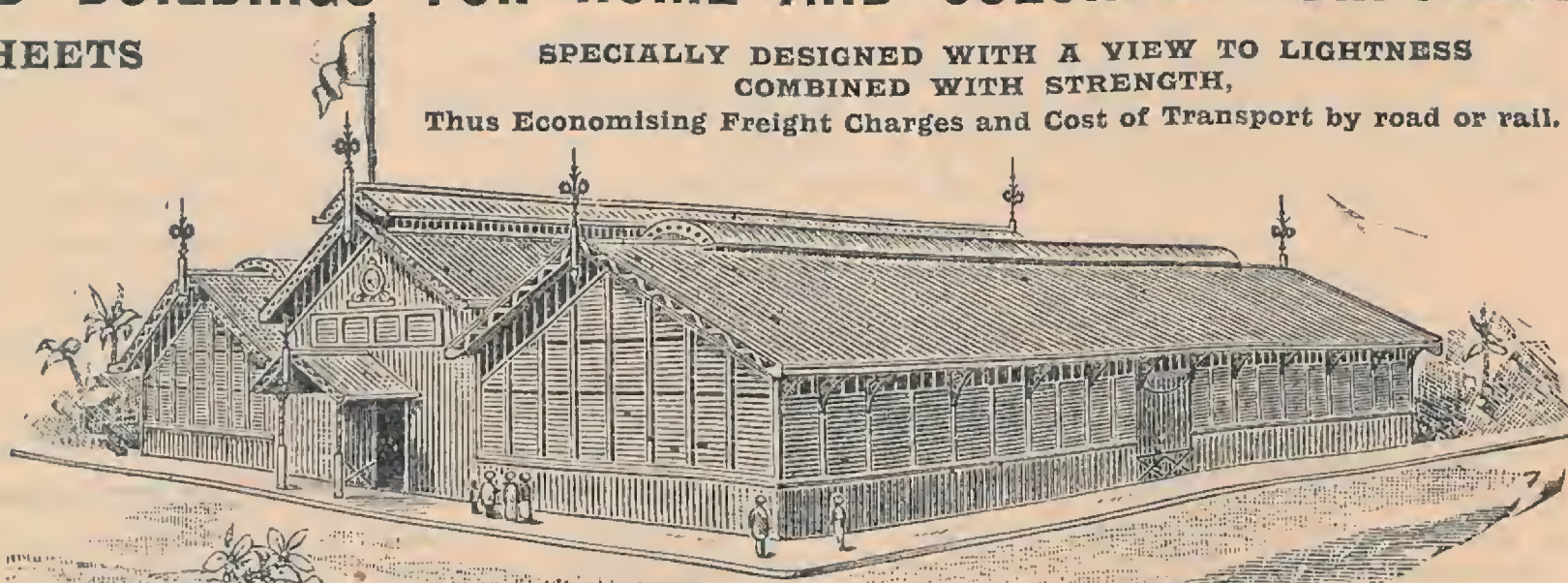
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THE LATE SIR FREDERICK ABEL.

Sir FREDERICK AUGUSTUS ABEL, Bart., G.C.V.O., K.C.B., D.C.L., F.R.S., etc., the Honorary Secretary and Director of the Imperial Institute, died suddenly at his residence, 2, Whitehall Court, London, S.W., on Saturday, September 6th, at the age of 75.

Sir FREDERICK ABEL was officially connected with the Imperial Institute from the commencement of its existence, and devoted himself to its services until the day of his death. He was Secretary to the first Organising Committee, and, on the opening of the Institute in 1893, he became Secretary and Director, a post which since 1897 he has held in an honorary capacity.

At a meeting of the Executive Council of the Imperial Institute held on September 17th, LORD JAMES OF HEREFORD presiding, the following resolution was unanimously passed:—

“That the Members of the Executive Council of the Imperial Institute desire to express their sense of the great loss sustained by the death of Sir Frederick Abel.

“For sixteen years he devoted all his great ability and energy to the service of the Imperial Institute; for that service he quitted all other pursuits, and in it he sacrificed time, emoluments and health.

“Every Member of the Council had learnt to value the worth of a great friendship, the loss of which is now sincerely mourned.”

The funeral service was held on September 11th, at the Church of St. Martin-in-the-Fields, Trafalgar Square, in the presence of a large and distinguished assemblage. The chief mourners were Mr. Charles Denton Abel (brother), Mr. and Mrs. Mackeson (niece), and Miss Abel (niece). The KING was represented by Colonel Lord Edward Pelham Clinton; Colonel the Hon. Sir William Carrington was to have represented the PRINCE OF WALES, but was unavoidably prevented from attending.

The Imperial Institute was represented by Sir Steuart Bayley, Sir Horace Tozer, Sir Walter Peace, and Colonel Makins, M.P. (Members of the Council), Professor Wyndham Dunstan, F.R.S. (the Director of the Scientific and Technical Department), Lieutenant Gerald R. Maltby, R.N. (the Assistant Secretary), and several members of the Staff.

The Royal Society was represented by Sir William Huggins, K.C.B., the President, and Mr. A. B. Kempe, the Treasurer.

The Chemical Society was represented by Professor M'Leod, F.R.S., and Dr. Alexander Scott, F.R.S.; the University of London by the Rev. Dr. Robertson, the Vice-Chancellor, and Professor Sylvanus Thompson, F.R.S.; the Board of Trade by Mr. Llewellyn Smith; the Athenæum Club by Mr. H. R. Tedder, the Secretary; and the Goldsmiths' Company by Mr. R. Montagu Tabor, the Prime Warden, and Sir Walter Prideaux, the Clerk; and the British Association by Professor Wyndham Dunstan, F.R.S.

Others present included Sir Andrew Noble, Bart., F.R.S., Sir George Birdwood, K.C.I.E., Mr. A. W. Reynolds, of the Canadian Office (representing Lord Strathcona, High Commissioner for Canada); Mr. T. G. White (representing the Agent-General for New South Wales); Professor Odling, Sir John Watney (representing the City Guilds of London Institute); Mr. W. H. Patchell and Mr. W. G. McMillan (Institution of Electrical Engineers); Mr. Walter Hills (past-president of the Pharmaceutical Society of Great Britain); Mr. Edgar Worthington (Secretary of the Institution of Mechanical Engineers); Mr. Wyndham Cook (representing the Alexandra House Association, Kensington Gore); Dr. Ludwig Mond, F.R.S., Dr. Messel, Mr. William Coldstream, Mr. W. Shelford, C.M.G., Professor Church, F.R.S., Mr. Henry Wheatley (representing the Society of Arts), Mr. Samuel Hall (Society of Chemical Industry), and Mr. S. E. Carr (Institute of Chemistry), Mr. T. Tyrer, Dr. Kellner (Woolwich Arsenal), Dr. Boverton Redwood, Mr. Arthur Dowd (Iron and Steel Institute), Mr. Alexander Siemens, Mr. Kraftmeier and Dr. Dupré.

Wreaths were sent by the Staff of the Imperial Institute, the Royal Academy of Music, the Chemical Society, the Athenæum Club, the Society of Chemical Industry, the Institution of Electrical Engineers, Lord James of Hereford, Sir George Birdwood, and many others.

The interment subsequently took place at Nunhead Cemetery.

At the Meeting of the Council of the Imperial Institute, held on September 17th, Lord James of Hereford presiding, the following resolution was passed:—

“It is directed by the Executive Council that until the transfer to the Board of Trade takes effect, or until these directions be rescinded, the general business of the Imperial Institute is to be conducted by the Assistant Secretary (Lieut. G. R. Maltby, R.N.) and the Director of the Scientific and Technical Department (Professor Wyndham R. Dunstan, F.R.S.).

“The Assistant Secretary will have charge of the current expenditure of the Institute and the general business of the Office.

“Professor Dunstan will take general direction of the Indian and Colonial Collections, the Commercial Intelligence Department and the City Branch, the JOURNAL, and the Library, and will be in communication with the Curators and the members of the Staff connected with these Departments, and will conduct all correspondence relating to them.

FINANCIAL AND COMMERCIAL RETROSPECT.

UNITED KINGDOM.—Considering that there were two working days fewer than in the same month of the preceding year, the trade returns for August last must be considered fairly satisfactory with only a small decrease in the imports, and a fractional increase in the exports. In the former, which were valued at £40,412,571, the decrease amounted to £524,569 (or 1·2 per cent.), and was most marked in the case of dutiable articles of food and drink, and raw materials for textiles. Thus wheat, mainly owing to smaller supplies from the United States, fell off by about a million-and-a-quarter cwt. (15·7 per cent.), its value being less by £378,999 (14·2 per cent.). In wheat-flour the decline was proportionately still greater, amounting to 599,886 cwt. (29·8 per cent.) in quantity, and £261,728 (or 28·8 per cent.) in value. In oats, too, there was a heavy fall, amounting to 53·0 per cent. in quantity, and 43·9 per cent. in value. Barley, however, improved, and in Indian corn there was a rise of £200,000 in value (21·2 per cent.) and of 778,766 cwt. in amount; this increase was mainly due to larger consignments from Argentina and Roumania, the United States having sent only 393 cwt. against 640,300 cwt. in the same month of last year. In sugar there was a drop in price; with a reduction of 1·9 per cent. in quantity, the unrefined article showed a loss in value of 19 per cent., while the refined, though its quantity was 41·0 per cent. greater, only increased 15·8 per cent. in value. The imports of tea again were about 2½ million pounds greater (9·7 per cent.), but the value was nearly £8,000 less. In raw materials for textiles raw cotton was less in quantity by about 68,000 cwt. (17·9 per cent.), while its value fell off by £177,983 (19·1 per cent.); less was sent from the United States and from Egypt, though more from Brazil and the British East Indies. Flax and jute were better; the latter increased 116·6 per cent. in quantity, and 98·1 per cent. in value, but hemp fell off, and raw silk was worse by 61·2 per cent. in quantity, and 58·8 per cent. in value. Sheep's wool also suffered a severe reduction, owing to smaller importations from all countries except France and the British East Indies; the fall in quantity was nearly 19½ million pounds, and in value £587,838, both over 42 per cent. Hewn and sawn timber together increased over 11 per cent. both in value and in quantity, but the increase was due to the sawn wood, since the hewn was much less. Of meat generally, both live and dead, smaller supplies were received from the United States, and though the deficiency was, to some extent, made up by importations from other countries such as Argentina and New Zealand, the net amounts were uniformly smaller, as were also in most cases the values. Butter, however, continued its triumphant course, and increased by over 50,000 cwt. in weight, and by a quarter-of-a-million sterling in value, the total imports being 381,321 cwt., valued at £1,880,066. How much longer will English farmers, in their stupid supineness, allow this huge sum to pass into the hands of foreigners who have the sense to conduct this dairy-farming on organised and systematic methods? The exports reached a total value of £24,299,826, thus showing an increase of £94,257, or 0·38 per cent. In coal there was a decrease of 291,481 tons (7·2 per cent.), the value being less by £484,599, or 17·8 per cent. A marked increase was recorded in iron and steel, which increased by nearly 100,000 tons (42·5 per cent.) in weight, and was worth over half-a-million sterling (27·8 per cent.) more. In machinery and millwork there was scarcely any change; new ships sold to foreigners increased by £61,955. In cotton piece-goods the demand was higher from Morocco, Dutch East Indies, Japan, the United States, Brazil, Uruguay, Argentina, and British South Africa, but less from Greece, Turkey, Egypt, and China; the net result was a diminution in quantity of 4·3 per cent., and in value of 2·5 per cent. In cotton yarns and twist, also, there was a decrease, but other cotton manufactures improved by 7·2 per cent. Jute yarn, linen yarn, and linen piece-goods all showed substantial increases both in quantity and value, but jute piece-goods, although their value was slightly greater, were worth 6·5 per cent. less. Sheep's wool exhibited the very large increase of over 162 per cent. both in quantity and value, as a result of large exportations to the United States. Woollen and worsted yarns and tissues all increased in quantity, and to a smaller extent in value, but woollen carpets, though 5·7 per cent. greater in quantity, fell off by 3·2 per cent. in value. An increase of 1·9 per cent. in the amount of refined sugar was accompanied by a fall of 17·7 per cent. in its value. Chemical manures were worse by 4·0 per cent. in quantity, but their value was 17·2 per cent. higher, while soda compounds increased 10·9 per cent. in the former, and 14·9 per cent. in the latter, respect. The re-exports of foreign and colonial merchandise were worth £5,698,640 compared with £6,166,955 in August of last year.

According to a recently issued Parliamentary paper, the gross liabilities of the United Kingdom, which on March 31st, 1901, amounted to £705,723,878, a year later stood at £768,543,386, thus showing an increase of £62,719,508. In the Funded Debt there was a net increase of £58,405,095: on the one hand, Consols were created to the extent of £60,000,000; on the other, Funded Debt was reduced (1) by operation of life annuities and annuities for terms of years, £1,242,314, (2) by application of sums derived from Land Tax Redemption and Composition of Stamp Duty, £3,221,765, and (3) by sundry means, £29,826; total, £1,594,905. The estimated assets were £27,935,000, the market value of the Suez Canal shares purchased in 1876, together with "other assets," representing £726,855, the total being £28,661,855. The Exchequer balances

amounted to £8,566,948. The net debt, therefore, on March 31st last was £731,224,583.

COLONIES.—In the course of his Budget speech, Sir J. Gordon Sprigg said that the debt of Cape Colony amounted to £38,000,000, the whole sum, with the exception of £6,000,000, being for reproductive works which paid more than the interest charged. For the two years ending July 1st, 1902, the total expenditure was £19,224,000, and the total revenue £17,030,000. The revenue for the ensuing year he estimated at £10,350,000, the surplus being put at £286,227. The gold output of the Witwatersrand showed a considerable increase in August; it amounted to 162,750 oz. of fine gold, whereas in the preceding month it was 149,179 oz., and for the same month of last year 28,474 oz. The Government has determined to throw open for pegging the proclaimed areas in the Barberton and Pietersburg districts, which together cover some 650,885 morgen. The former includes the Selati goldfields and the Smitsdorp goldfields, while the latter includes the Kaapsche block. The Rhodesian output in August was also better than in the preceding month, amounting to 15,747 oz. against 15,226 oz. In August of last year the amount was 14,734 oz. The Budget statement of the Australian Commonwealth showed that the total revenue for the past year amounted to £11,288,903, of which nearly nine millions were derived from Customs and Excise duties, and most of the remainder from the Post Office. The expenditure was £3,926,809, the chief item being the Post Office, £2,336,465. The balance paid to the different States, amounting to £7,368,418, was divided as follows: New South Wales, £2,385,905; Victoria, £1,920,974; Queensland, £904,775; South Australia, £616,148; Western Australia, £1,225,076; and Tasmania, £315,540. For the current year the revenue is put at £11,510,104, the Customs and Excise being estimated to yield £9,055,000, and the Post Office £2,444,400. The expenditure is expected to amount to nearly four millions sterling, including 2½ millions for the Post Office, and the balance returnable to the different States is estimated at 7½ millions. The report of the Department of Mines of Western Australia states that the yield of gold for 1901, viz., 1,879,391 oz., was the largest ever recorded, being 298,441 oz. greater than in 1900, and 235,514 oz. greater than in 1899. The Murchison, East Murchison, Mount Margaret, East and North Coolgardie fields, showed increases varying from 18 to 39 per cent. over the previous year, but in some of the other fields, notably in those from Peak Hill northwards, there was a decrease. The Goldfields Water Scheme is stated to be within measurable distance of completion. The quantity of gold exported from Western Australia and received at the mint during August last was 187,971 oz.; in August of last year it was 161,770 oz. In New Zealand the gold output in August was 35,609 oz., as compared with 30,742 oz. in the same month of the preceding year. In this colony last year the total expenditure on public works was £2,143,000; for the current year it is put at £2,193,000, the chief heads being railway construction, £743,000; roads and bridges, £335,000; goldfields and mining, £50,000; and public buildings, £288,000.

The variations which have occurred in the securities of certain Colonial Governments are shown in the following table:—

	29th July.	28th Aug.	29th Sept.
Canada 3 per cent. . . .	102½-103½	102½-103	102½-102¾
Cape 3 per cent. . . .	94½-94¾	94½-94¾	92-92½
Natal 3 per cent. . . .	95½-97	96½-97½	95½-96½
New S. Wales 3 per cent. . .	94½-94¾	94½-94¾	91½-92
New Zealand 3 per cent. . .	96-96½	96½-96¾	94½-95
Queensland, 3 per cent. . .	93½-94	93½-93¾	92-92½
South Australia 3 per cent. .	94½-94¾	93½-94½	92¾-93½
Tasmania 3½ per cent. . .	103½-104	103½-104½	103½-104½
Victoria 3 per cent. . . .	94½-95½	94½-95	93½-94
West Australia 3 per cent. (May-Nov.)	94-95	93½-94½	92½-93½

INDIA.—The following table shows the variations which have occurred in the securities of certain leading Indian railway companies, during the last three months:—

	30th July.	29th Aug.	30th Sept.
Bengal and North Western . .	128-132	128-132	128-132
Bengal-Nagpur Gua. 4 per cent. .	105-109	102-106	102-106
Bombay, Baroda & Cent. India .	154-158	150-155	151-156
Indian Midland 4 per cent. . .	105-109	103-107	103-107
Madras Grntd. 5 per cent. . .	134-139	133-137	133-137
South Indian 4½ per cent. Deb. .	137-141	137-141	137-141
Southern Mahratta 3½ per cent. .	104-107	103-106	104-107

FOREIGN COUNTRIES.—Last year the imports from all Africa to the United Kingdom amounted to £26,435,000, and the exports to £32,288,000, bullion and specie being, in every case, exclusive of these sums. British Africa sent £12,066,000 and took £21,830,000, while Egypt sent £11,906,000 and took £6,419,000. With regard to French Africa, the imports and exports each amounted to about 1½ million, and Portuguese Africa took about 1¼ millions. The largest customers of Great Britain were Cape Colony, Egypt, and Natal, which, together, accounted for about 47 millions out of a total trade of 59 millions. From the official statistics of German trade with Africa in 1901, it appears that the total of the export and import trades together only exceeded £500,000 in the case of Egypt and British possessions in South and West Africa. The imports from Egypt were worth £1,605,000 (a considerable decrease), and the exports £825,090 (a slight increase). From British South Africa, the imports to Germany were worth £1,095,000, and the exports £1,000,000; both showed an increase, the former of

£165,000, and the latter of £375,000. From British West Africa, the imports were valued at £1,545,000, and the exports at £380,000.

Our usual table of exchanges follows:—

	29th July.	28th Aug.	29th Sept.
Paris, cheques	25f. 16c.	25f. 18c.	25f. 16-½c.
Berlin, sight	20m. 48pf.	20m. 48½pf.	20m. 45½-6pf.
Vienna, sight	23kr. 96½h.	23kr. 96½h.	23kr. 95h.
Amsterdam, sight	12fl. 12½	12fl. 12½	12fl. 13
Madrid, sight	34ps. 40	34ps. 46	—
Lisbon, sight	41½d.	41½d.	41½d.
St. Petersburg, 3 months	94r. 10	94r. 15	93r. 90
Bombay, T.T.	1s. 3½d.	1s. 3½d.	1s. 3½d.
Calcutta, T.T.	1s. 3½d.	1s. 3½d.	1s. 3½d.
Hong Kong, T.T.	1s. 8½d.	1s. 8½d.	1s. 8½d.
Shanghai, T.T.	2s. 3½d.	2s. 4d.	2s. 3½d.

AGRICULTURAL RETROSPECT.

UNITED KINGDOM.—The corn harvest of 1902 is described by the *Times* as the most protracted, troublesome, and expensive harvest of recent years. Everywhere a large proportion of the cut corn has been secured in a more or less damaged condition. The injury done to the grain varies greatly, as the rainfall has varied; but very few bright and unsprouted samples of wheat have been shown in the markets at present. Oats, especially in the north of England and Scotland, were a heavy crop, but the damage done by the violence of winds and heavy rains has seriously diminished its value to the farmer. Barley has only been marketed in small quantities at present, but from the samples so far seen it is to be feared that what was a promising crop at the end of August will realise only second rate prices. An indication of the excellence, as regards quantity at any rate, of this year's hay crop, is seen in the weekly returns of our imports of hay, which continue to show a decrease, as compared with the corresponding returns of last year. A fine crop of mangolds is assured, in fact a week or two of sunshine would make it a record one. The damage done by storms to hops in Kent is very great. The most striking feature in the appearance of the country at the present moment is the remarkable verdure of the grass lands, and in the absence of severe frosts the pastures will be of great value for a considerable time. The outlook for stockowners is very favourable, as there is an abundance of winter keep in sight both in the fields and in the stack yards. It appears that the extent of land in Great Britain devoted to the cultivation of small fruit this year is, with one exception, the largest on record. It now amounts to 75,378 acres. Of this acreage Kent claims nearly one-third. The acreage of hops used to exceed that of small fruit, but this has not been the case during the last twelve years, and this year's extent of hops is only 48,024 acres.

COLONIES.—The results of a series of experiments on the cold storage of fruit, which have been carried out at the Ontario Agricultural College, are of considerable practical interest. Apples and pears are found to keep best when wrapped singly in paper, and packed in a shallow box not larger than a bushel. They ship best when, in addition, they are packed in layers with "excelsior" between. Apples keep better at a temperature of 31° Fah. than at a higher temperature, but the experiments did not show what is the best temperature for pears. Cold storage cannot make bad fruit good, nor can it prevent bad fruit from becoming worse. Only good specimens will keep for any length of time in cold storage, or will pay for storage. Where long storage is desired, it pays to select the best fruit and to pack it in the best manner known. The extra labour and cost of material are more than repaid in the greater quantity and better quality of the fruit left at the end of the storage period. In the case of apples and pears—and probably of most kinds of fruit—the fruit should be picked and stored in advance of dead ripeness. The process of maturation goes on more slowly in cold storage than on the tree. The medium sizes of apple and pear keep longer than the largest, provided all are perfect specimens and picked at the same time. It is suggested to be an advantage, especially as regards pears and peaches, to pick the larger specimens first, and leave the smaller to mature later. Fruit, on removal from cold storage, should be allowed to warm gradually, and moisture should not be allowed to deposit upon it. If, however, the wetting cannot be prevented, the fruit should be spread out and dried as quickly as possible. For all kinds of fruit, there is a time limit, beyond which it is unprofitable to hold the fruit in cold storage or anywhere else. That limit for sound fruit is dead ripeness. Duchess pears can be kept profitably until late in December; Fameuse, or Snow, apples, until March or April. The time limit has to be determined for each kind of fruit. Proper conditions being provided in the storage room, the most important points then to be observed are the selection of sound fruit, grading it into uniform sizes, one size only in a case, and care in packing. The results of these experiments can thus be made use of by the household, in preserving fresh fruit for its own future use; by the fruit-grower, in securing better prices for good fruit later in the season, in the local markets; and by the shipper, in enabling him to take advantage of the higher prices offered in foreign markets.

A very useful addition to the good work he has already done for CANADA, has been made by Mr. John Dyke, whose name is well known throughout the Dominion, in his successful efforts to induce Canadian farmers to improve

the quality of their live stock. As an indication of how the leaven is working, it may be mentioned that up to the present date 467 head of British pedigree Shorthorns have been imported into Canada, as compared with 131 over the same period of last year. In the case of other breeds of live stock, results not less satisfactory have been obtained. Mr. Fisher, the Dominion Minister of Agriculture, is vigorously attempting the improvement of the horses of Canada, and the first report of the newly-appointed director of horse-breeding has just been issued. Dr. Rutherford, who advocates the use of suitable stallions of British breeds, is well known on this side of the Atlantic, he having been for some time veterinary examiner of pedigree stock for shipment to Canada. As a member of the Manitoba Parliament, he introduced several important measures relating to horse-breeding, and these are now being adopted by the older provinces. At the Western Canada agricultural fair recently held at Winnipeg, the transition that is taking place in the prairie province from wheat-growing to mixed farming was much in evidence. The stock parade on that occasion was regarded as one of the most impressive ever made in Canada, a number of American exhibits being included.

Mr. P. C. Cork, Colonial Secretary of BRITISH HONDURAS, includes the following observations on the agricultural prospects of the colony, in the latest report to the Colonial Office. The resources of British Honduras are so considerable that it is marvellous that much greater development has not taken place than is shown by the returns. At least four rivers could be made navigable for light draught steamers for considerable distances inland, and a dozen for canoes or doreys. The Hondo, New River, and Sarstoon, are already being used to some extent for navigation by moderately large craft, but their utility might be increased. Mahogany, logwood, vanilla, cacao, rubber (*Castilloa elastica*), sapodilla (from which "chicle" or chewing gum is prepared), and pimento or allspice are indigenous, and pine trees and various hardwoods are present in great abundance. The soil in many large areas is peculiarly suitable for the growth of the sugar cane, and factories of very large size could be established if capital were forthcoming. Bananas, oranges, pineapples, rice, and maize are only a few of the products which grow luxuriantly. The bounteousness of nature seems to have made existence so easy in the past that the inhabitants have not been stirred to exertion by necessity, and have lived almost solely by cutting mahogany and logwood found in the forests, which are floated down the rivers. Attempts have been made within recent years to cultivate bananas, but cultivation is hampered by want of agricultural knowledge on the part of the landowners and the difficulty of obtaining labourers accustomed to any other kind of labour than that of wood-cutting. The cultivation of cacao is being attempted, but has not yet expanded to any considerable extent. Before agriculture can be expected to become a thriving industry, it will be necessary to facilitate transport by improving the navigation of the rivers and by making good cart roads or tramways leading to the rivers or the sea-coast: this is especially necessary in the case of banana cultivation, the fruit being perishable and needing great care in handling. Communication by telegraph or telephone will also be necessary if a thriving business is to be carried on. No use is at present being made of the vanilla, pimento, or lumber (other than mahogany, cedar and logwood). Vanilla grows luxuriantly in the forests. There seems good reason to believe that a lucrative industry could be established in the production of the bean if attention were paid to the matter. Another natural product of the forest at present almost entirely wasted is the cohune nut, which yields the finest oil for table and other purposes, while the refuse might be suitable for food for stock. Immense quantities at present go to waste. The intelligent expenditure of capital in this vast storehouse of natural wealth might be expected to yield very large profits, but it seems to be a rule that in countries where the climate is most rigorous and the conditions of life hardest, the necessities of the situation spur human beings to the greatest exertion and sharpen their wits to cope with their environment, while the opposite effect is produced when nature is bounteous. This, doubtless, accounts in a great measure for the prosperity of the British possessions in the north and the relative backwardness of those towards the south on this Continent.

The latest telegrams state that splendid rains have fallen in VICTORIA, and the wheat crop of the State has greatly benefited. A large area of wheat is reported to have been sown. The coastal districts of NEW SOUTH WALES have been favoured with sufficient rain for immediate requirements, but the condition of the wheat crop does not warrant the anticipation of a good yield from the area sown. In parts of QUEENSLAND there have been beneficial rains. SOUTH AUSTRALIAN prospects are said to be somewhat less unfortunate than those of the other States mentioned.

INDIA.—The latest telegrams report that good rain has fallen throughout the country, completely changing the outlook, and removing for the present all serious anxiety. No area is now suffering from drought, and the numbers on famine relief are diminishing everywhere. In character the monsoon resembles that of 1884, which was prolonged into the first week of October; hence the prospects are exceptionally good. The area sown for the cotton crop was substantially in excess of the average in the United and Central Provinces, and elsewhere was either equal to the average or a little in excess of it. Sufficient rain has fallen to justify the anticipation of a satisfactory yield. The return obtained will, however, be measured by the adequacy and distribution of the rainfall up to the end of the monsoon. For the sugar-cane crop the season has been on the whole favourable, except in East Bengal and part of Behar. The normal area under cane is estimated at 740,200 acres, and the area

planted this year at 716,000 acres. It is estimated that the yield will be from 90 to 94 per cent. of a normal crop.

FOREIGN COUNTRIES.—The tomato-growing and canning industry continues to make great strides in the UNITED STATES. Over the five years 1897 to 1901 Maryland packed an annual average of 1,840,000 cases; Indiana, 697,200; New Jersey, 685,400; California, 473,200; Delaware, 360,000; and Ohio, 190,200. A case holds 24 cans, each containing 3 lb., so that a case represents 72 lb. of tomatoes. One bushel of tomatoes will fill 14 cans, whence it follows that each case demands nearly $1\frac{3}{4}$ bushels. When the figures denoting the production of the different States over a series of years are looked into, a very great variation in the bulk of the crop from year to year comes into view. Indiana, for example, which packed 1,020,000 cases in 1898, turned out no more than 420,000 in 1901. With the cereal crops of that State the quantity of rainfall during the growing season is the main factor in determining the size of the crop. Rainfall is of the utmost importance also in determining the yield of tomatoes, but, in addition to this, a late spring or an early frost in the autumn may diminish the crop to the extent of fully one-half. The crop is also liable to fungus diseases, which are more apt to result in serious damage when several tomato crops are grown in succession upon the same land. In raising tomatoes for canning the grower's first object is to obtain a large yield. Early maturity is of second importance, as he contracts to sell the whole crop at a fixed price. This circumstance has to be considered in selecting the variety of tomato to be raised, the soil, and the kind of manurial dressing. In Indiana the usual practice is for the canneries to furnish the plants, so that the grower has only to concern himself with the selection of the soil, the manuring, the cultivation, and the harvesting. For tomatoes for canning a much heavier soil and one of greater natural fertility may be employed than is recommended for the tomatoes for the early market. Though it is rather more difficult to cultivate tomatoes on heavier lands, it is the experience of catsup makers that on such lands a tomato of superior quality is produced, in that the relative quantity of pulp in the tomato is increased. To obtain heavy yields it is essential that strong land be used or heavy manuring resorted to. The crop for the cannery is one for which a relatively low price is obtained, and hence the cost of manuring has to be carefully considered. The tomato plant is a gross feeder, and requires an abundant supply of potash. It has been estimated that ten tons of fruit with the accompanying vines would contain 57 lb. of nitrogen, 16 lb. of phosphoric acid, and 94 lb. of potash. Results of experiments made at the Indiana agricultural experiment station show that on plots which received artificial manures there was not only a great increase of yield, but many more tomatoes ripened early in the season, a matter of considerable moment in years when early frost occurs. There appears to be a field for the profitable use of commercial fertilizers in tomato growing on lands such as have been used. The formula given for compounding the fertilizer includes muriate (chloride) of potash. Some experiments on early tomatoes apparently indicate that the sulphate of potash gives tomatoes of better quality. If, therefore, it is desired to secure better quality as well as increased yield, it would probably be preferable to supply the potash in the form of sulphate. All properly made tobacco manures contain the potash as sulphate, and the tobacco and tomato plants are closely allied botanically.

It may seem difficult to believe that a country like RUSSIA takes the lead amongst civilised nations in the provisions she makes for the effective study of the problems of agricultural meteorology, but such is the case. The system of agricultural-meteorological institutions was established by the Russian Meteorological Bureau so recently as 1897. The object sought is to bring observations on meteorology and on agricultural phenomena into closer relation, with a view to determining more definitely the effect of various meteorological conditions on crop production. At each station there are plots not exceeding 2·7 acres in area, and on these plots various crops are grown. The meteorological apparatus for measuring the temperature and the humidity of the air, the intensity of the sunlight, the direction and velocity of the wind, and other factors in the weather, are arranged adjacent to the plots. On the last-named are fixed up a rain-gauge, thermometers for determining the temperature of the soil at the surface and at different depths, and also apparatus for ascertaining the humidity of the soil, and measuring the snow-fall. Phenological observations are made regularly on the crops under cultivation, and a record is kept of the different stages in the development of the plant, of the work done on the plots, of any injuries caused by meteorological or other factors, and of the yields of grain and straw. The stations differ in their equipment, and are divided into two classes accordingly. Those in the second class have only the more common apparatus, and consequently their investigations are of a less extensive character. Last year there were 66 of these agricultural-meteorological stations, 21 being of the first class, and 45 of the second, together with 113 "observation plots," 90 of which were equipped with apparatus for studying soil moisture as well as the atmospheric conditions. In addition to its work in agricultural meteorology, the bureau is elaborating plans for weather forecasting, and it also publishes papers on technical subjects, such as the relation of the cereal crops to sun-spots and meteorological factors. If nothing more is done than to work out satisfactory methods and a basis for correlating the meteorological and soil conditions with the production of staple crops, the results will be of widespread importance, and will pave the way for similar studies elsewhere. This Russian enterprise has attracted the attention of the Washington Department of Agriculture, and it is quite possible that similar work will ere long be in progress in the United States.

LABOUR RETROSPECT.

UNITED KINGDOM.—The industrial situation did not improve last month, and again compared unfavourably with a year ago, the percentage of unemployed being a little over four and a-half. This is better, however, than affairs on the Continent, where the percentage of unemployed varies from 6 per cent. in Germany to 9 per cent. in Austria. The position of the coal trade is, perhaps, made a little easier, owing to the good demand for export due to the American coal strike. In Scotland a further reduction of $6\frac{1}{4}$ per cent. took place in miners' wages, leaving the daily wage at 5s. 6d. In the engineering trade a satisfactory arrangement has been arrived at regarding the bonus system. A memorandum has been mutually agreed to between the workmen's executive, on the one hand, and the employers' executive on the other, as follows:—(1) The time rate of wages for each job should, in all cases, be paid; (2) Overtime and night-shift to be paid on the same conditions as already prevail in each workshop; (3) A time limit, after it has been established, should only be changed if the method or means of manufacture are changed; (4) No firm should establish the bonus system without intending to adhere to it. All restrictions to the working of the bonus system in federated workshops should now be at an end.

Some further particulars have been published regarding the Commission of Enquiry into the relations between labour and capital in the UNITED STATES. Mr. Mosely directs the attention of the members of his commission to the fact that the increase in manufactured exports of the United States has (comparing figures for 1889 and 1898) been accompanied with an increase of some 44 per cent. in the number of manufacturing establishments, of 51 per cent. in the capital employed, of 42 per cent. in the cost of the materials used, and of 39 per cent. in the value of the manufactured products, but that the total of the wages paid has increased by only 23 per cent., and the number of wage-earners only by 25 per cent. In other words, to convert a given value of raw material into manufactured articles costs much less in wages, and required far fewer workmen in 1898 than it did ten years before. The members of the commission will have an opportunity of investigating, each in respect of the industry he is best acquainted with, the circumstances underlying this cheapening of production, which, it must be evident, is a factor of great importance to all countries that have to enter into commercial competition with the United States. The coal-miner, whose product is the basis upon which practically all manufacturing industries depend, will be interested to note that the average output of coal in the United States rose from 133 millions of tons 1889–1890, and 162 millions in 1894–1895, to 233½ millions in 1899–1900. The annual averages for the same periods in Great Britain were 179½ millions, 189 millions, and 222½ millions: hence, though in 1899–1900 we had a lead of 45½ millions annually, and in 1894–95 one of 26½ millions, in 1899–1900 we were 11 million tons behind. In the same period the average value of coal at the pit's mouth has risen considerably in this country, from 6s. 8d. in 1894 and 6s. ½d. in 1895, to 7s. 7d. in 1899, and 10s. 9d. in 1900. In the United States, on the other hand, the value per ton has scarcely altered, but has remained steady from 1894 to 1900 at about 5s. per ton. Too much stress must not be laid on the difference of cost in America and this country, because of the enormous differences in the fuel values of different coals, but, seeing that cheap coal is a matter of vital interest to all the trades represented on Mr. Mosely's commission, the delegates may be expected to enquire whether American practice cannot give some hint as to how the great difference between the cost on the two sides of the Atlantic may be lessened. This hint they may find in the fact that the average annual output per man employed in America is about 550 tons, whereas in Great Britain it is only about 300 tons, and when they come to enquire into the causes of this difference they can scarcely fail to see one of them in the use of machinery at the working face, when they learn that in 1896 only 14·17 per cent. of the output was won by machinery, and the output per man was only 443 tons, whereas in 1900 the proportion obtained by machinery was over 25 per cent., and the output per man had increased to 548 tons. This change, moreover, was not effected by the miners working more hours per day than their English brothers, although they doubtless worked more days per week, since the eight hours day was largely introduced in American mines in 1897. In the production of iron and steel, a matter of great concern to almost all of them, the delegates will see the same increase in output, accompanied by mechanical handling of the materials, and the conduct of operations on the largest scale. The delegates may ask themselves whether everything possible has been done by themselves and by their employers to increase and cheapen the production of iron and steel in this country, and in face of the equipment they will see in American ironworks their answer can only be in the negative. Even in industries in which this country is still well ahead they may see signs which, as intelligent men, they must interpret to mean that we cannot continue to lead unless we are unremitting in our exertions to improve our methods. Generally speaking, it may be said that the recent industrial advance of America has been greatly helped by the introduction of labour-saving appliances, which has been rendered possible by the readiness of the American workmen to accept them. In this respect it can scarcely be doubted that the British manufacturer has shown himself much less enterprising than the American, but it must also be confessed that often, when he has been disposed to be enterprising, scant welcome has been accorded to his proposed changes, even though, as American experience shows, they would have been to the benefit no less of his men than of himself.

COLONIES.—It is stated that the demand for labour at the TRANSVAAL mines is still greater than the supply, and that managers are utilizing all the white labour that is available. Last August no less than 9,122 white men were employed, with only 2,455 stamps in operation, whereas in 1898, when 73 mines were at work, the number was 9,476. During July and August there was an increase in the number of white men taken on of 1,988, and in the number of natives of 1,330. Recruitment of native "boys" proceeds slowly, but an impetus is anticipated now that the old system of payment per head is being resumed. Another important decision which should bring good results, is that the hammer and drill boys should in future be paid by piece-work. The need at Johannesburg at present is chiefly for men of the artisan class, and particular note should be taken of this fact. If teachers, clerks, and shop assistants seek work in Johannesburg they will be confronted by serious difficulties, owing to the largely increased cost of living.

FOREIGN COUNTRIES.—The deputation which was appointed by the National Society of Gun Workers to enquire into the methods of manufacture in BELGIUM, and to investigate the social conditions of the people there, have now presented a report on their visit. From a general survey they conclude that the agricultural system in Belgium is one of the chief reasons for the success achieved by the people in commercial competitions. Travelling from Holland to Antwerp they did not see a square foot of land capable of producing that was not put to use by the tiller of the soil. Peasant proprietorship was the order, and, if the wages earned were smaller than in this country, that was more than compensated for by the advantages accruing from low rents and the raising of produce. Travelling from Harwich to Birmingham, they saw acre after acre of land capable of producing but lying waste and fallow. They frequently found gun-workers, action fillers, barrel fillers, and stockers, working in a little shop at the side of their house, to which was attached a large strip of land cultivated in the best possible form. Sometimes live stock was kept. Rents were low and the tenant might become the owner of the freehold in about fifteen years, but if he became the freeholder he did not pay taxes. Coming to the manufacturing aspect of the case they found everywhere system, order, cleanliness, good machinery, and a discipline that was not of an arbitrary or overbearing kind, but a disposition of mutuality which indicated that the employer and the workman felt they had responsibilities towards each other, and acted accordingly. The men did not appear to labour so hard as the worker in England laboured; but they were more persistent and constant in the application of their energy, so, even if they worked more slowly, good results were accomplished. The technical schools are very favourably commented on in the report. Belgians, say the deputation, recognize the plain fact that merely learning to use a file is not technical education, and that science should be studied in its application to industry. It seemed to them that, while Belgian workmen did not earn so much money, and worked in many instances longer hours than the workmen in this country, their needs were fewer and their cost of living not so high. They could not, however, admire the Belgians for permitting the women population to work so hard as they did. The successful trade competition of the Belgians was not altogether due to low wages and long hours. That was only one aspect of the case. Better machinery and greater enterprise had more to do with it, as well as the fact that the manufacturers themselves seemed to mix with the workpeople, and were for the most part practical workmen. The land question also had to be taken into account, and the drink question played an important part. Concluding, the report says:—"What is required now is for the employers and workmen to get together. In the face of an emergency like this there should be no two opinions about the necessity for absolute unity between capital and labour, and we firmly believe that if the employers would trust the men and take them into their confidence occasionally, the employes would be willing to work in harmony for the good of the trade, and help to stem the tide of loss of work resulting from the keen competition which exists, and, as it appears to us, the taking away of our industry by the Belgians." From recently published statistics of the industrial situation in Belgium, it appears that out of a total of 750,000 belonging to the working classes, the hours of labour are under ten hours for about one-tenth of the number, ten hours for one-third, while the balance work ten, eleven, and more than eleven hours in smaller proportions. The eight hours day is only observed by four per cent. of the population. Excepting in the mines, night work is not frequent, while the proportion of long days is considerably more among women than among men, and occurs chiefly in textile industries. A little over a fourth of the population gains less than 2 f. (1s. 7d.) per day, and about a fourth 2 f. to 3 f. per day. A fourth earns 3.50 f. to 4.50 f. per day. The foregoing scale applies to the male population; the wage-earning power of women is considerably less, nearly one-half of the female population receiving less than 1.50 f. per day, while only 395 women in the total population are tabulated as receiving from 4 f. to 4.50 f.

The report on the trade of the UNITED STATES for the year ending June last, by Mr. Bell, the British commercial agent, contains some interesting information with regard to strikes and wages. Strikes during the last twelve months have only slightly affected the prosperity of the country. As a rule those that have occurred have been of short duration, the employers in most cases acceding to the demands of the men rather than lose their share of the large profits being made. The most notable case, perhaps, was that of the New England textile workers, when 10,000 of them obtained an increase of 10 per cent. in their wages, this following upon other considerable increases during the last two years. The United States Steel Corporation caused considerable sensation when, a short time ago, the working men in all branches of the steel works had their wages increased without having asked for it. Present prosperity, of course, fully justifies these increases in wages. Not only are the manufacturers and transportation companies making large profits, but the cost of living has gone up enormously during the last few years. Wage-earners were never before so fully occupied nor so well paid. Probably a number of factors have contributed to this result. While it is true, no doubt, that prices have advanced faster than wages, the hardship to the wage-earner has unquestionably been in considerable measure off-set by steadier employment. For some years past the industries of the nation, as a

whole, have been kept so busy as to necessitate the steady employment of a maximum working force. In some former periods, when the disparity between prices and wages was less striking than it is to-day, such was not the case. At such times the wage-earner was frequently in danger of having to tide himself over long intervals of enforced idleness. Though a dollar then would at any given time procure for him more of the necessities of life than it will now, he did not have the dollars coming to him to him, month after month, and year after year, with the regularity that has been the case in the last few years.

SCIENTIFIC AND TECHNICAL DEPARTMENT OF THE IMPERIAL INSTITUTE.

NOTES ON SPECIMENS OF SOUTH AUSTRALIAN TIMBERS.

By WALTER GILL, F.L.S., CONSERVATOR OF FORESTS FOR THE STATE OF SOUTH AUSTRALIA (RECEIVED THROUGH THE AGENT-GENERAL FOR SOUTH AUSTRALIA), WITH NOTES ON THE WORKING QUALITIES OF THE TIMBERS BY HERBERT STONE, F.L.S., EXPERT REFEREE TO THE IMPERIAL INSTITUTE.

1. *Eucalyptus gonicalyx* (F. Mueller), vernacular name "Bastard Box." References: Benth. *Flor. Aust.*, Vol. III., p. 229; Mueller's *Eucalyptographia*, First Decade; Mueller's *Extra Tropical Plants*, p. 120.

A fair-sized tree of rather limited occurrence in South Australia, growing only in a stunted form on the hill tops in Flinder's Range, from Wirrabara to Mount Remarkable, and thence as far north as Mount Brown, but attaining a height of 100 feet or more in better land in the valleys. An excellent timber is obtained from this tree, suitable for telegraph poles, fencing posts, sleepers, well-slabs, felloes, naves, and other wheelwright's timber. Weight, when seasoned, from about 50 to 60 lb. per cubic foot.

Working qualities.—The wood saws rather hard but freely. Grain very sinuous. Smell slightly vinegary when worked; one specimen was sufficiently strongly scented to enable one to recognise the characteristic smell of Eucalyptus oil. Planes with considerable difficulty and a good surface is difficult to obtain, the wood being "cross-grained."

2. *Eucalyptus rostrata* (Schlecht), vernacular name "Red Gum." References: Benth. *Flor. Aust.*, Vol. III., p. 240; Mueller's *Select Extra Tropical Plants*, 145; Mueller's *Eucalyptographia*, 4th Decade.

Found extensively throughout South Australia. A fine large tree of spreading habit, attaining frequently a height of 100 feet, but generally developing a large bole of from six to eight, or, in special cases, of ten feet in diameter at the base. The quality of the timber varies with the kind of "habitat." That grown on hilly ground cannot be excelled, though somewhat lighter than that grown in rich moist land, and, according to situation, the weight per cubic foot varies from 50 to 70 lb. in seasoned timber. The colour is generally dark red, hence its name; and, though sometimes hard, it is more easily worked than any other gum. It is admirably adapted for a great variety of uses, either above or under ground, or in water. As fencing posts it will last thirty years and even more, standing unrivalled for this purpose; nor can it be excelled for piles or railway sleepers when of the best quality, as it resists well both the white ant and the teredo. For shipbuilding, house and waggon work it is well suited, and also for many minor uses, amongst which it may be noted that it is much preferred for bullock yokes, as it wears smooth without splintering. As a timber for furniture—especially veneers—selected pieces are admirably fitted, the mottled and wavy figure often met with being singularly beautiful; when very dark in colour it frequently resembles the best mahogany. It also makes good blocks for street paving and an excellent material for parquet flooring. Single trees, when felled and converted into sleepers, have occasionally produced as many as 100, 220, and even 250 sleepers of the dimensions 6 feet 6 inches by 8 inches by 4½ inches.

Working qualities.—The wood is very tough; it saws very hard and planes with difficulty; its surface bad and patchy, being cross-grained.

3. *Eucalyptus leucoxylon* (Mueller), vernacular name "Blue Gum." References: Benth. *Fl. Aust.*, Vol. III., p. 209; Mueller's *Select Extra Tropical Plants*, 138; Mueller's *Eucalyptographia*, 1st Decade.

Found in N. S. Wales and Victoria, where it is known as the "Ironbark tree." Widely distributed throughout South Australia, attaining a height of from 80 to 100 feet and a diameter of 3 to 5 feet. The timber is exceedingly strong and durable, generally weighing from 60 to 70 lb. per cubic foot when seasoned. It makes excellent naves, felloes, spokes, sleepers, posts, mining timber, well-slabs, piles and telegraph poles; very useful also for purposes requiring great lateral strength. The colour of the timber varies from pale yellow to brown, and even pale red or pink in some localities, and is thus often well adapted for furniture, especially for parquet flooring in combination with other gum timbers. The bark, which is fibrous in character, affords a good material for paper.

Working qualities.—This wood saws hard but not harshly; it has little or no smell. It planes rather easily; its surface rather patchy and cross-grained, but not so much so as No. 2, as the grain is not so sinuous.

4. *Eucalyptus hemiphloia* (F. Mueller), vernacular name "Box Gum." References: Benth. *Fl. Aust.*, Vol. III., p. 216; Mueller's *Extra Tropical Plants*, 121; Mueller's *Eucalyptographia*, 5th Decade.

A fair-sized tree, often of spreading habits, from 50 to 90 feet high and 3 or 4 feet in diameter at base, when growing on hilly country in South Australia. Found also in Victoria and N. S. Wales, where it reaches larger dimensions in more humid districts. In South Australia it occurs principally on the Flinder's Range, and is easily distinguishable from other gums by its persistent bark on trunk and

lower limbs, though it sheds the bark on the higher limbs, whence originates its name of "half-barked." A most valuable timber, dense, hard, and of great strength, with close interlocked grain; it is admirably suited for many and varied uses, such as naves, felloes, shafts, spokes, railway sleepers, fence posts and rails and mauls. It is pale yellow in colour generally, though sometimes of a browner tinge, and, when seasoned, weighs from 60 to 70 lb. per cubic foot.

Working qualities.—It is very hard to work, is harsh, troublesome to saw and bad to plane, being cross-grained.

5. *Eucalyptus odorata* (Behr), vernacular name "Peppermint Gum." References: Benth. *Fl. Austr.*, Vol. III., p. 215; Mueller's *Eucalyptographia*, 2nd Decade.

Generally a small-sized tree, but sometimes attaining larger dimensions; widely distributed throughout the colony. Timber useful for fencing posts, also for wheels when of sufficient size, and free from "pipe." Makes excellent firewood, and first class mauls for driving wedges.

Working qualities.—It has no smell, is hard, extremely harsh to saw, planes hard and badly, is patchy and cross-grained, but surface not very rough.

6. *Eucalyptus corynocalyx* (Mueller), vernacular name "Sugar Gum." References: Benth. *Fl. Austr.*, Vol. III., p. 218; Mueller's *Select Extra Tropical Plants*, 134; Mueller's *Eucalyptographia*, 2nd Decade.

This tree is found in South Australia, principally near Port Lincoln, on Kangaroo Island and in the Flinder's Range. The wood is hard, dense, and durable; losing but little in seasoning; it weighs, when dry, generally 65 to 70 lb. per cubic foot. It is yellowish brown in colour, often showing a handsome wavy grain. It is used for posts, rails, piles, wheelwright's work, and railway sleepers; also for furniture selected pieces cut to veneers have proved very effective, while for parquet flooring, in common with several other Australian timbers, it possesses many serviceable qualities.

Working qualities.—It saws extremely hard, and planes hard and badly. It is free from odour.

7. *Casuarina quadrivalvis* (La billardiére), vernacular name "Sheoak." References: Benth. *Fl. Austr.*, Vol. VI., p. 195; Mueller's *Extra Tropical Plants*, 78.

Generally distributed throughout South Australia, attaining 60 feet in height under favourable circumstances, but more frequently 30 or 40 feet on high elevations and poorer soils. As a fuel this timber is unrivalled; it is also used for posts and rails, for which it is not well adapted, but for spokes and axe- and pick-handles it is much in demand.

Working qualities.—It saws with difficulty, being extremely hard, and planes hard and roughly on "the quarter" (radial section), but smoothly enough in other directions. The figure of this wood is superb, resembling oak but of a redder colour.

8. *Frenela robusta* (Mirb), vernacular name "Native pine." References: Benth. *Fl. Austr.*, Vol. VI., p. 234.

A hardy tree, growing on sandy rises and stony hillsides, also along the course of the River Murray, in many localities occurring widely in the dryer parts of the colony. The timber is of considerable value for fencing posts, well-slabs and telegraph poles, being proof against the attacks of white ants. It makes excellent fuel, and is especially esteemed by blacksmiths, as it gives a very strong, quick heat, and is thus especially suited for tiring wheels. When of sufficient size it is frequently converted into sawn timber for house-building, but is often subject to shakes and sometimes brittle in character, which defects, however, do not detract from its value to any extent when used entire in the round or in rough slabs, in which form it has been largely used by settlers in house-building.

Working qualities.—It saws freely and rather harder than Deal, which it much resembles, and it planes easily, fast, and fairly smoothly.

9. *Eucalyptus paniculata* var. *fasciculosa* (Mueller), vernacular name "Pink Gum." References: Mueller, *Trans. Vict. Institute*, 34; Benth. *Fl. Austr.*, Vol. III., p. 212.

A moderate-sized tree occurring in the Mount Lofty Ranges and adjoining ranges, the Ninety Mile Desert, and sandy rises in the south-east of the State. The timber from this gum is of a most durable character, unsurpassed for its lasting qualities underground, equal in every respect to best red gum, though seldom found in such large dimensions. For posts, wheelwright's work, sleepers, well-slabs, bridge timber, jetty piles, it is a first-class timber. It is much the colour of red gum, but is never so subject to ring shakes and gum veins.

Working qualities.—It saws easily but harshly, planes very hard and roughly; its odour is faintly acetic.

10. *Eucalyptus obliqua* (L. Herit), vernacular name "Stringybark Gum." References: Benth. *Fl. Austr.*, Vol. III., p. 206; Mueller's *Select Extra Tropical Plants*, 133; Mueller's *Eucalyptographia*, 3rd Decade.

A tall tree with persistent bark, attaining a height of 100 feet and over, with a diameter of 3 or 4 feet, found in the Mount Lofty Ranges and the south-eastern part of South Australia, generally on poor ironstone and sandy rises. A useful timber of 50 or 60 lb. weight per cubic foot when dry; of good tensile strength, very fissile, light in colour, and adapted for fencing posts and rails, shingles, palings, rafters, and scaffold poles.

Working qualities.—It saws fairly readily, the grain being not quite so sinuous as some of the other Eucalypts. It planes hard and badly.

11. *Eucalyptus viminalis* (Labill), vernacular name "Manna Gum." References: Benth. *Fl. Austr.*, Vol. III., p. 239; Mueller's *Eucalyptographia*, 10th Decade; Mueller's *Extra Tropical Plants*, 148.

In some localities this tree is only of small spreading habits, in better sites it grows to finer proportions. It is found in the Barossa and Mount Lofty Ranges,

and southward as far as Mount Gambier. Though generally considered a decidedly inferior timber and little used, it has occasionally been found to stand well for fencing posts for some years. It also makes good rough boarding for hut and shed making.

Working qualities.—It saws hard yet freely, and planes very hard and roughly. This wood has a strong unpleasant smell.

12. *Acacia melanoxylon* (Brown), vernacular name "Blackwood." References: Benth. *Fl. Austr.*, Vol. II., p. 389; Mueller's *Select Extra Tropical Plants*, 7.

Generally found only south of the Flinder's Ranges in South Australia, preferring a deep moist soil, on which it attains a height of 80 feet, and several feet in diameter. A most valuable timber, largely used for furniture, railway carriages, boat-building, tool handles, casks, and veneers, which last are considered equal to walnut.

Working qualities.—It saws fairly easily and planes easily, but rather roughly, on account not of being cross-grained, but of its somewhat coarse grain. It works more freely than any of the dark coloured Acacias. This is an excellent wood, both for general and ornamental purposes.

THE USE OF LIQUID FUEL.

The use of oil fuel for steam purposes has been strongly advocated in many quarters for some years, and it has been generally conceded that in certain respects it offers many advantages over coal, but it is only recently that the system has been at all widely adopted. This delay may, perhaps, be accounted for (1) by the difficulty there was in obtaining adequate and regular supplies of liquid fuel; (2) by the fact that many countries possess abundant coal supplies, whereas the oil would have to be imported; and (3) by the practical difficulties which have been experienced in working with liquid fuel. Considerable success has, however, been attained during the last few years and the progress made is indicated in two recent papers, one by Mr. J. S. S. Brame in *Nature* (Vol. 66, p. 186), the other read by Mr. E. L. Orde at the last meeting of the Institution of Mechanical Engineers.

Any liquid hydrocarbon of sufficiently high flash point may be utilized as liquid fuel, but the supplies of natural oil will always furnish the bulk of the material used, and crude petroleum, which has been treated to remove the more volatile constituents and thus raise its flash point above the imposed limit for use as fuel, is now being imported into this country. Besides this, however, there are at present many bye-products which can be economically utilized, such as the oils obtained in the manufacture of coal- and oil-gas, which are specially suitable for locomotive work, and are largely employed on the Great Eastern Railway; but there is no doubt that, if the use of liquid fuel is greatly extended, the price of these oils would be much enhanced and the imported natural oil would be the form chiefly used. The disadvantage of being thus dependent upon an imported fuel has been clearly recognised by the engineers who have worked at the question, and all modern appliances are so designed that they can be worked indiscriminately with either oil or coal, so that consumers can take full advantage of the fluctuations in price of either fuel.

The various methods which have been adopted for admitting the liquid fuel into boiler furnaces may be broadly divided into the following classes:—(1) injection with compressed air through nozzles of such a form that the oil is broken up into a fine spray and thus rendered inflammable; (2) injection by a jet of steam, while at the same time air, heated if necessary, is also drawn in to supply the oxygen necessary for combustion; (3) vapour burners in which the oil is volatilised and the vapour admitted to the furnace, and (4) the more recent method of Korting, in which heated oil at considerable pressure is directly injected into the furnace. The steam spray method has been most largely used, since it does not require any auxiliary apparatus for the production of the blast, as when air is employed, and on locomotives this method is universal. Korting's method has, however, proved very successful on the steamers of the Hamburg-American line, and will, doubtless, be largely adopted in the future. In addition to the actual burning apparatus, each installation requires some form of filter to free the oil from impurities and some arrangement for separating water from the oil.

The calorific value of the average fuel oil may be approximately taken as 10,500 centigrade units, whereas that of good steam coal is 8,000 to 8,500 units, so that the former has a decided advantage in this respect. But since it is impossible to obtain anything like the full heating effect of a fuel in any boiler, the best test is obtained by comparing the results given by the two classes of fuel under exactly similar conditions. The evaporative power of liquid fuel has been very variously stated, figures varying from 14 to 46 lb. of water evaporated per lb. of fuel burnt being quoted, but it may be taken that in modern practice with steam injection an efficiency of 15 lb. is a very fair result, while comparisons with coal in the same boilers, and under the same conditions, have given 7 to 8½ lb. of water evaporated per lb. of coal. A series of careful tests carried out by the Engineers' Club of Philadelphia gave the following figures:—

1 lb. anthracite evaporated	9.7 lb. of water.
1 lb. bituminous coal	10.14 " "
1 lb. oil, 36° B.	16.48 " "
1 cub. ft. of gas, 20 C.P.	1.28 " "

The results obtained on the Grazi and Tzaritzin Railway, representing the working of a large number of engines, have been carefully recorded by Mr. Urquhart, and show that, during the winter, liquid fuel was 41 per cent. in weight and 55 per cent. in cost better than anthracite coal, or 49 per cent. in weight and 61 per cent. in cost better than bituminous coal; and during the summer still better results were obtained. The Great Eastern Railway were the pioneers in the use of oil fuel on locomotives in this country, and have now more than sixty such engines in use, some of which cover the distance of 138 miles from Liverpool-street to Cromer in 175 minutes, including a stop of 4 minutes, on a consumption of 14.4 lb. of tar oil per train mile and an equivalent of 5 lb. per mile of coal, which is used in raising the steam necessary for starting the oil injectors. Other English railway companies are now having engines fitted for oil fuel, and boilers designed for the same purpose are being erected at Woolwich Arsenal and for many private firms.

It is, however, on sea-going vessels that the use of oil fuel compares most favourably with coal in cost and general advantages, and the number of steamers burning liquid fuel is steadily increasing. The ships of the Shell Transport Company, the first English shipping firm to employ oil fuel, have accomplished several very fine performances, and one of them, the s.s. *Murex*, recently arrived at Thames Haven from Borneo, *via* Singapore and the Cape, having steamed 11,830 miles on a consumption of 800 tons of prepared liquid fuel. The average daily consumption was from 17 to 18½ tons, while the same vessel, when under coal, used from 24 to 25 tons per day. The Canadian Pacific Railway have also found that the use of oil fuel on their steamers has effected a saving of 56 per cent. on the cost of firing with coal. The following table has been drawn up by Mr. Orde

from particulars supplied by different steamship companies using oil fuel, and gives the results actually obtained in practice with both oil and coal :—

Ship.	Type of Burning Installation.	Consumption of Oil per I.H.P. per hour in lb.	Consumption of Coal per I.H.P. per hour in lb.	H.S.	I.H.P.	Ratio of consumption of Oil to Coal.
"C.F. Laiesz"	Korting	1'408	1'93	7,560	2,200	73 : 100
"Sithonia"	Howden	1'065	1'49	—	2,500	71'4 : 100
"Murex"	Rusden-Eeles	16 tons per day	25 tons per day	5,202	—	64 : 100
"Syriam"	Do.	1'32	—	2,480	800	—
"Khodoung"	Orde	1'08	1'67	2,700	960	64'5 : 100

All these vessels have triple expansion engines of normal proportions except the "Sithonia," in which quadruple expansion machinery is fitted, and from the above figures it appears possible to realise in actual practice, under the normal working conditions of the mercantile marine, the full difference in calorific value between liquid and solid fuel.

There are several other factors which favour the use of liquid fuel on sea-going vessels in addition to its superior evaporative power and the consequent reduction in cost. In the first place its use leads to a great diminution in the number of stokers required, so that it again effects a considerable economy; in one case 25 men were required for stoking 14 tubular boilers when coal was used, but with liquid fuel six men sufficed, and on the s.s. *Murex*, 20 stokers were necessary when under coal, while only three were required to attend to the oil burners. Liquid fuel has also a slight advantage over coal as regards storage, for whereas one ton of steam coal requires 43 to 45 cubic feet, the same weight of oil only requires 36 cubic feet; and, further, the latter can be carried in places where the storage of coal is impossible on account of inaccessibility, or it can be stored in the water ballast tanks. Owing to this advantage in storage and the superior evaporative power, a vessel burning liquid fuel can reserve a much larger cargo space than when using coal, or with the same weight of fuel in the two cases it would be able to steam much further with oil. Other advantages of oil fuel are that it is much more convenient and cleanly to take on board, there is no trouble with ash or clinker in the furnaces, as there is no solid residue of any kind, and the whole quantity carried is actually available as fuel.

For the reasons which have been indicated above, the use of liquid fuel is rapidly extending, even in countries like England, where adequate supplies of steam coal are available, though it is probable that coal at a fair price will always have the advantage over imported oil fuel. In places entirely dependent upon imported fuel, however, oil will in future probably become the chief form of supply, since, weight for weight, it is much more efficient than any form of solid fuel, and its transport in suitable vessels is attended with far less risk than with coal cargoes shipped from a great distance.

THE SAPPHIRE FIELDS OF ANAKIE.

Sapphires have been known, for several years past, to occur in a number of localities near the small railway station of Anakie in Central Queensland, and a report was written on the subject in 1892 by Dr. Jack, giving details of their occurrence and of the prospecting work carried on up to that time. An examination has recently been made by Mr. B. Dunstan, of the Geological Survey of Queensland.

The Anakie railway station is situated on the main Central Queensland line; it is 26 miles west from Emerald and 192 miles west from Rockhampton. The sapphire fields extend from it in a northerly and westerly direction. The Drummond range is the main watershed of the Anakie district, having the Lamia, Anakie and other ranges branching off from it. The most prominent landmark is Mount Leura, a peak about 2,000 feet high. The whole of this area is drained by tributaries of the Nagoa river, of which Theresa creek is the principal affluent. It is the smaller branches of Theresa creek, however, such as the Central, Tomahawk, Retreat, Argyle and Sheep Station creeks, about which most of the deposits of sapphire wash are to be found. There is no difficulty in travelling over most of the country drained by these creeks, but some of it is mountainous and other low-lying parts are covered with a dense scrub. Granite and its varieties form the oldest and most extensive system of rock-masses in the district. Gneisses, schists and slates rest against the granites, and the gradual changes of these rocks from one to the other can be observed in places, and from which it is assumed that the granite is of metamorphic origin. Intrusive rocks occur—both acidic and basic. The former, consisting of pegmatite, felspar porphyry, and felsites, are in great abundance and traverse the granites and gneisses in all directions. The basic variety is either massive hornblende rock or diorite. There are also outcrops of epidote and garnet rock in places, resulting probably from the alteration of limestones in contact with the granite. The next younger formation consists of a series of shales, sandstones and conglomerates, and probably belong to the Permian-carboniferous formation. No fossils, however, have been found in them. There are no representatives of the Mesozoic Formations to be found in the district, except boulders of a hard flinty quartzite occurring in Tertiary and Recent alluvial deposits. These remnants of a pre-existing formation are general in their occurrence in Central Queensland and peculiar to that district. The rock is known to miners as "Billy" and has been placed as of "Desert Sandstone" age. It occurs exclusively in the alluvial sapphire deposits formed below the junction of the Drummond beds and the granite. The sapphire deposits are distributed over a large area, but nearly all are confined to the granite district and occur on the banks of the creeks. The thickness of the sapphire wash varies considerably in various workings, in some places being only a few inches, while in others it amounts to several feet. The bottom is usually a reddish clay resting on decomposed schists and slates. Mistakes have been made in supposing this red clay to be invariably the bottom, since richer beds have at times been found below. Frequently the wash is clayey and requires "puddling" before the sapphires can be extracted. Much, however, is loose and friable, and the stones are then obtained by "dry sieving." The important deposits of the district may be separated into the four following main divisions: (a) Retreat creek and Sheep Station creek.

- (b) Policeman creek.
- (c) Tomahawk creek.
- (d) Central creek.

On *Retreat creek* there are numerous, but generally small, claims. The sapphires found vary in colour and are blue, green, yellow, and parti-coloured. The rock boulders and pebbles in the wash include several varieties of "Billy," red and brown jasper, basalt and other rocks, and amongst the smaller pebbles tourmaline, topaz, rock crystal and varieties of chalcedony. In one claim two yellow sapphires, weighing nearly 50 carats each, were unearthed. The most important area of sapphire-bearing country occurs a few miles up Retreat creek, near to Mt. Bullock, and is about four miles long.

Deposits of sapphire wash occur on both the north and south sides of *Policeman creek*. The workings on the southern side are mostly on the central and western portions, that to the east not containing sufficient stones of marketable size to make it remunerative. The deposits on the north side extend some distance and then cross to the south side of the creek, and are connected higher up with those of Iguana Flat. The stones at the latter place are large, and diminish in size to the lower end of Policeman creek.

Of the *Central creek* deposits very little is known. Their position and area have been fixed approximately, and a rapid inspection disclosed immense bodies of wash, forming whole

hills and ridges which can be traced continuously for miles. What the ultimate result will be when they are prospected it is impossible to say, as they might be very poor in sapphires or exceedingly rich. On the surface, wherever inspected, pieces of corundum and pleonaste and occasional fragments of sapphires of a light green colour were found. The creek is 27 miles north-west from Anakie station.

The sapphire deposits of *Tomahawk creek* are the most extensive in the whole district. They are, in places, a mile in width and several miles in length, extending from Mount Hoy to below the junction of Tomahawk and Central creeks. Entire ridges are composed of the wash, so the deposits must be of great thickness. The area so far prospected is exceedingly small compared to its vast extent. The total length, so far as is known, is about fifteen miles, but it is probable they extend further north. The wash is similar to that of Central creek, and the sapphires found were shades of blue, green and yellow.

The methods used at present for separating the sapphires from the wash-dirt are very simple. If the dirt is loose and dry it may first be passed through an ordinary gravel screen to remove the larger pebbles, and then the fine dust is removed by means of the dry-jigger, which consists of a screen on four upright springs of brigalow wood. The sapphires are picked by hand from the intermediate product; as they are generally coated with clay or iron oxides, there is probably a considerable loss in the operations. In the wet method of treatment the same sieves and jiggers are used, and the sorting is done more expeditiously and with less chance of losing the stones than in the dry way. Sluice boxes are not used on account of the insufficient supply of water during the greater part of the year. It has been estimated that up to the time of inspection £10,000 worth of sapphires had been sold to dealers in these stones.

THE INDIGO INDUSTRY OF INDIA.

The report of the Royal Botanic Gardens, Calcutta, for the year 1901-2 contains some interesting notes on the question of indigo cultivation in India and the identity of the plant at present grown there. It appears that in the early days of the Indian indigo trade there were two centres of export, if not of cultivation, the source in these two cases not being the same. One of the centres was Surat, and the indigo exported from this place was obtained from a form of the Egyptian indigo plant, *Indigofera articulata*, which is still met with in many parts of India, notably in Scinde and Rajputana. The other centre was Ceylon and the Coromandel coast, and here the indigo was derived from the true Indian plant, *Indigofera tinctoria*, the produce of which was even then held in less esteem than the Surat indigo. The cultivation of the Surat or Egyptian indigo gradually extended eastward and finally reached the Upper Gangetic plain, but there is no evidence that it ever extended to Bengal proper. A third variety of indigo, *I. sumatrana*, was introduced into Malabar, apparently from Eastern Malaya, by the Dutch when they held possession of that territory, and later the same plant reached Bengal, either direct or through Malabar. This *I. sumatrana* proved to be a much more satisfactory variety than either the Egyptian or the Indian, and its cultivation spread to such an extent that the two earlier varieties were almost entirely superseded, so that the indigo plant which is now grown so largely in the Gangetic plain is not the true Indian indigo, *I. tinctoria*, as is generally supposed, but has been derived from a Malay variety, *I. sumatrana*.

Within recent years a variety of East African indigo, *I. arrecta*, has been introduced into the Dutch Indies, where it is known as Natal indigo, and has been so favourably received that it appears to be displacing all the other Asiatic and American varieties previously cultivated there. It has been proposed to introduce this East African indigo into India on an extensive scale, but to such a course it has been objected that it cannot possibly succeed as well as the present plant, which has hitherto been regarded as the true indigenous variety. As already pointed out this is not so, and the indigo plant now cultivated in Bengal is just as much an exotic as the East African, so that there is no reason why the latter should not now supersede the present Malayan indigo by virtue of its superior characteristics, just as that displaced the earlier varieties. A number of varieties of indigo have been under observation for some time in the Gardens, and the East African has proved capable of successfully withstanding adverse conditions which have been fatal to the others. Thus in September, 1900, very severe floods were experienced which practically destroyed all the Indian and American varieties without harming the East African, and during 1901 the latter was again entirely unaffected by the attacks of an insect pest which killed nearly all the plants of the other varieties. The plant, therefore, appears to be a remarkably hardy variety and merits the attention of the Indian indigo planters.

In this connection the present position of the Indian indigo industry may be briefly reviewed in the light of the statistics recently published in the return of the Trade of India in 1901-2. The artificial production of indigo upon a manufacturing scale has resulted in severe competition between the natural and synthetic article, and the consequent fall in price has had a very adverse effect upon the Indian industry, which is illustrated by the following table, giving the exports for the last six years :—

Year.	From Calcutta.	From Madras.	From other ports.	Total.	Value.
	Cwt.	Cwt.	Cwt.	Cwt.	Rs.
1896-97	109,001	43,680	16,842	169,523	4,37,07,570
1897-98	71,364	48,165	14,320	133,849	3,05,74,019
1898-99	81,779	42,760	10,648	135,187	2,97,04,781
1899-1900	59,078	39,853	12,489	111,420	2,69,25,107
1900-01	71,637	18,940	11,914	102,491	2,13,59,808
1901-02	55,038	25,400	9,312	89,750	1,85,22,554

The steady decline shown by these figures has been brought about partly by the bad seasons which have been experienced during recent years, but more largely by the restriction of cultivation which has resulted from the low prices now obtained. In Lower Bengal the cultivation of indigo has already diminished almost to the vanishing point, but in Bihar the planters are attempting to meet the new condition of affairs by the introduction of scientific methods of treatment, which aim at giving an increased yield of purer indigo with a diminished cost, and are also insuring themselves against ultimate failure with indigo by the cultivation of other more remunerative crops. It is too early to say what can be accomplished in these ways, but now that the planters are thoroughly alive to the situation, some improvement may be looked for, though it is admitted that the present position of the industry cannot be regarded without misgivings.

THE OIL-PALM OF WEST AFRICA.

The extraction of palm-oil and palm-kernels, the two principal products of the oil-palm *Elais guineensis*, is one of the most important industries on the West Coast of Africa, the trade in these two articles at the present time being estimated at about £2,500,000 per annum. Curiously enough the preparation of the oil has never been attempted in factories under the supervision of Europeans, but has remained altogether a native industry, so that the methods of extraction are tedious and wasteful. Dr. Preuss, the Director of the Victorian Botanical Gardens, gives an account, in a recent number of *Der Tropenpflanzer*, of some experiments he has made in the Cameroons on this subject, and makes several suggestions

which, if they could be adopted, would greatly economise the present cost of production. The fruit from which the oil is made consists of an outer coating of tough pulp, and an inner hard shell enclosing the kernel. The pulp which contains the palm oil is, by the native method, first softened by boiling for two hours in water, and then beaten from the hard inside shell with wooden pestles, forming a fibrous, oily mass, from which the crude oil is pressed out by hand. This raw product is then refined by melting it in hot water and skimming off the oil as it floats to the surface. It is obvious that the fibrous residue of pulp must, under these conditions, retain much oil, and in one experiment, made under Dr. Preuss' directions, only about 33 per cent. of the available oil was obtained. Usually, however, better results are secured, since analyses of the fibrous residue made in Europe show a content of oil varying from 12 to 20 per cent. The author gives in the original paper impressive figures showing the enormous losses which this failure to extract the whole, or at least the greater part of the available oil, means to West Africa in general and the Cameroons and Togoland in particular. At the present time there is no way of avoiding this loss, but he points out that it should be possible to devise a cutting machine which would separate the pulp from the nut, when the former could be readily worked up in some form of hot oil press. A machine for this work would, however, have to be capable of readily adjusting itself to deal with fruits of various sizes.

From the mass of pulp referred to in the foregoing paragraph the nuts are picked out by hand, and laid aside to be worked up for the contained kernels, the latter being usually obtained by breaking up the nuts one by one with a hammer, although in a few places machines have been introduced for this purpose. The kernels are usually exported as such, no attempt being made by the natives to prepare palm-kernel oil for export. The latter is somewhat like cocoa-nut oil in properties, and is principally used for the manufacture of soap in Europe. Dr. Preuss also gives some interesting information regarding two local varieties of this tree, which have been named the small- and large-fruited Lisombe respectively, and which both differ from the ordinary oil-palm in having more brittle shells enclosing their kernels; a peculiarity of obvious advantage to the kernel extractor. The following table shows the oil and kernel content, and other facts of commercial importance with regard to these varieties:—

Variety.	Pulp in whole fruit.	Palm Oil in whole fruit.	Palm Oil contained in pulp.	Kernel in whole fruit.	Palm- kernel Oil in whole fruit.	Oil contained in kernel.
	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.
Small-fruited Lisombe.	71.0	32.6	45.9	9.54	4.9	49.2
Large-fruited Lisombe, ripe	71.0	44.4	62.5	12.5	6.15	50.1
Large-fruited Lisombe, unripe	64.5	40.8	62.4	17.2	8.5	50.1
Ordinary Palm	37.5	22.6	60.2	14.5	7.13	49.1

An examination of these figures will show that the fruits of both Lisombe varieties are richer in palm oil than that of the ordinary palm, although they furnish a smaller proportion of kernel. Since, however, the latter is less valuable than palm oil, this is no disadvantage. Of the two Lisombe varieties it would be best to utilize the large-fruited kind, since this gives both more oil and more kernel than the small-fruited sort. The author calculates that at present rates the value of the products obtained from 100 kilos. (225 lb.) of the Lisombe fruits would be 21s. 9d., whilst the corresponding value of the same weight of ordinary palm fruits would be 14s. 6d. A series of tables showing the probable profits derivable from this industry is given, but it is pointed out that the outlay of capital by Europeans in this direction would be unwise until machinery for the extraction of the palm oil has been devised, and as far as the Cameroons are concerned, until a railway and good roads have been provided, so that the regular transport of fruits to the factories could be ensured.

FURTHER OBSERVATIONS ON THE MOSQUITO BLIGHT OF TEA.

In a previous number of this JOURNAL (August, 1901) a short summary was given of a report by Mr. Ernest Green on *Helopeltis Antonii*, the "Mosquito Blight" of tea. The following is taken from a paper by the same author (issued as a Circular of the Royal Botanic Gardens, Ceylon), and briefly summarises the results of further observations on this subject.

The present investigation was undertaken in the Kelani valley district of Ceylon, at a time when the ravages of this insect pest had considerably abated, although the tea plants still showed signs of the recent attack.

The application of an acetylene gas light, as a means of capturing the insect, was tried in the following manner. An acetylene lamp fitted with a 50 candle-power burner was placed in a vessel containing kerosene and water, and set up in a place that bore ample evidence of the presence of *Helopeltis*. The lamp was lighted soon after sunset and allowed to remain until the next morning. The surface of the liquid in the vessel was then found covered with a mass of dead insects which, however, did not include a single specimen of *Helopeltis*. It seems evident, therefore, that this insect is not responsive to attraction by light.

An exhaustive examination of several tea plants was made to ascertain whether eggs were being deposited, and in what positions. The result showed that few eggs were then being laid, and that of these the larger proportion were in such a position that they would be left untouched by plucking the initial leaf. The paucity of recently deposited eggs was the more remarkable when it was found that the insects captured at this time contained a larger number of fully formed eggs than had been found previously at a period of greater activity of the insect. The author concludes from these observations that the period of inactivity is marked by the retention of the eggs in the bodies of the insects, until conditions are more favourable for breeding. The vitality of eggs in prunings was tested, and it was found that little danger need be apprehended from hatching of eggs on pruned branches. The practical immunity of the indigenous varieties of tea to attack from this pest was established, although it is quite possible that the insect may gradually adapt itself to live on indigenous tea if allowed to increase sufficiently.

The ravage caused by *Helopeltis* is increasing in Ceylon. Estates in the neighbourhood of Nawalapitiya at an elevation of about 2,000 feet are becoming affected, and the pest seems likely to become as virulent here as at lower elevations. In the Morawak Korale district, as in the Kelani valley, it is noticeable that the first period of activity of *Helopeltis* occurs in the dry, hot season, while the recrudescence is coincident with continuous south-west rains.

The breeding habit of the insect varies at different periods, and it is, therefore, important that the quantity of the eggs laid, and the position in which they are deposited, should be determined for every month of the year. It may then be possible to arrange a scheme of plucking the tea plant to suit the varying habits of the insect. It is recommended that close plucking be abandoned, for this system tends to produce a brush-like growth of small shoots which are particularly suited to the tastes of the *Helopeltis*.

The flight of the insect is weak and, as it does not fly high, there is little doubt that the work of checking this and other insect pests of similar habit, would be greatly facilitated by dividing the estates into smaller areas of from 10 to 20 acres, by growing suitable trees to form narrow but compact boundaries. It would be necessary to have some thick undergrowth to complete the screen, and for this purpose croton oil, annatto, castor oil or tapioca plants would prove useful. For the higher trees Para rubber, coconut, nutmeg or kola-nut might be employed. As an alternative the screens might consist of trees and plants the

clippings of which would prove useful for green manure, such as *Albizia moluccana* or "Dadap," with *Crotalaria* as an undergrowth.

The results of the present investigation show that more work is necessary before an adequate knowledge of the pest can be acquired, and a complete scheme of treatment devised.

Further investigations are now being made to ascertain the distribution of the pest and the extent to which it varies in habit in different localities.

RUBBER AND GUTTA-PERCHA IN NEW GUINEA.

Attention has already been directed in this JOURNAL to the valuable information acquired by the various scientific expeditions sent by the German Colonial Society to study the natural products of the German colonies and dependencies. At the present time a botanist, Herr Schlechter, has been deputed by this body to visit the South Sea colonies and to collect especially samples of rubber and gutta-percha there, for submission to consumers of these products in Germany. A report on some specimens so obtained in New Guinea is printed in the August number of *Der Tropenpflanzer*, from which source the following notes have been compiled. In March, 1901, several eight-year-old plants of *Ficus elastica* were tapped by incisions made every morning for six days, the exuded caoutchouc being collected every afternoon. The yield per tree was about five pounds. In the same month a six-year-old *Castilloa* species was tapped by felling and "ringing," the yield in this case being, however, only about twelve ounces, and similarly another tree of this species, three years old, gave only a quarter of an ounce when tapped by incision. On the other hand, a four-year-old plant of *Hevea brasiliensis* which was tapped by Curtis' method for ten days, gave nearly two ounces of rubber. The results of analysis of these specimens, made in the Pharmaceutical laboratory of Berlin University, and the values assigned to them by brokers and rubber dealers in various parts of Germany, are given in the following table:—

Source of specimen.	Age of tree.	Yield, oz.	Quality.	Content of true Caoutchouc, per cent.	Value per lb.
<i>Ficus elastica</i>	... eight years	... 80	"middling"	... 80.7	2 1/2 to 2 9/10
<i>Castilloa</i> species	... six years	... 12	"similar to Peruvian serap"	... 84.0	2 1/4
<i>Castilloa</i> species	... three years	... 1	"resinous"	... 58.6	1 1/8
<i>Hevea brasiliensis</i>	... four years	... 2	"good"	... 90.2	3 1/2

A sample of gutta-percha, also collected in New Guinea, was submitted to dealers in this product, and was also analysed in the Berlin University laboratory, with the results recorded below. The source of the sample is not stated.

Content of true Gutta-percha, per cent.	Content of Resin, per cent.	Value per lb.
56 to 74.8	25 to 35	2 1/8 to 4 1/10

The variation shown in these analytical results is probably to be ascribed partly to the difficulty of securing, with such a substance as gutta-percha, a thoroughly representative sample, and partly to the different processes used by the chemists of the various firms to whom the specimen was submitted.

GENERAL NOTES.

A NEW ELECTRIC FUSE.

A new form of electric fuse, notable on account of its simple and ingenious construction, has been designed by Mr. G. W. Partridge, the chief engineer of the London Electric Supply Corporation, and was shown at the recent Tramways Exhibition at the Agricultural Hall. It is chiefly intended for use on high-tension circuits carrying heavy currents, where the blowing of a fuse results in the formation of an arc which hitherto has been prevented from burning by using a very long fuse or by some form of oil fuse. Thus, on the 10,000-volt mains and transformers of the London Electric Supply Corporation, fuses of the tubular type, 4 feet 6 inches in length, were employed previous to the introduction of the present fuse. In the latter the extinction of the arc is brought about by a jet of carbon dioxide gas, which is liberated by the heat of the arc from a "sparklet," such as is now largely used for the production of aerated water. The "sparklet" consists simply of a small steel bottle containing liquid carbon dioxide and closed by a cap which can resist a pressure of 600 lb. per square inch. Only a short length of fuse wire is employed, and the terminals of this are connected to two sparklets, one at each end, between which the arc forms when the fuse is blown. In a very few seconds one or other of these is burnt through and the rush of gaseous carbon dioxide immediately extinguishes the arc. In addition to the fire-extinguishing properties of the gas there is a considerable reduction of temperature, as the liquid carbon dioxide passes into the gaseous state, and the explosion which occurs when the sparklet is pierced acts as a very efficient blow-out. Two sparklets are used on each fuse for additional security, but in the numerous practical tests which have been made one of these has always sufficed, and it is stated that not a single defective sparklet has been found.

The length of fuse employed on a 10,000-volt circuit is only 9 inches, instead of the 4 feet 6 inches fuses which were previously used; and, in fact, experiments have shown that on such circuits the arc can be extinguished with certainty, even when the gap is but half an inch in length. At the Agricultural Hall the fuse was shown working on a circuit of 2,500 volts, and in this case the arc was put out in less than three seconds. The fuse operates successfully whether blown by a short circuit or by a long-sustained excessive load, the latter being a particularly severe test, as the arc formed in such a case is peculiarly persistent. Various types of fuse have been designed for special purposes, and the device has also been adapted to switches which carry heavy currents. In these the sparklet is so placed that it is ruptured by the arc formed on opening the switch, while a fresh sparklet is inserted from a magazine of the revolver type every time the switch is closed. The different types of the new fuse have proved most satisfactory in practical use during the last eighteen months, and their simplicity and efficiency will commend them for trial to all who have to deal with high-tension circuits.

COCA CULTIVATION IN THE CAMEROONS.

Among other medicinal plants now being experimentally cultivated in the Cameroons is *Erythroxylon Coca*, the leaves of which yield the valuable alkaloid cocaine. The supply of the latter is at present furnished almost entirely by the countries on the Pacific border of South America, although several other tropical countries have at various times produced small quantities of the drug. The plant is being grown in the Victoria botanical garden of the Cameroons, and, according to *Der Tropenpflanzer*, August, 1902, a small sample of raw cocaine has been received in Germany, prepared from the African plants by Squibb's method. The yield of this crude alkaloid was about 8 per cent. A firm of alkaloid makers to whom the sample was submitted asked for a supply of the air-dried coca leaves. The latter were collected from the bushes in a small experimental plantation at Bula, and proved on examination to contain only 28 per cent. of total alkaloid. This low result is attributed by the chemist of the firm to improper drying, but the editors of *Der Tropenpflanzer* suggest that it may be due to the slight difference in the locality of the two plantations or to deterioration of the leaves during the long voyage, and point out that it would be advisable to extract the alkaloid in a crude form for exportation rather than attempt to export the leaves, unless the latter can be carefully packed in air-tight boxes without unduly increasing their cost.

PROCEEDINGS OF INSTITUTIONS.

THE INSTITUTION OF CIVIL ENGINEERS.

At the last annual meeting of the Institution of Civil Engineers of Great Britain, Mr. Charles Hawksley, the newly-elected President, delivered an interesting retrospect of the advance made during the Nineteenth Century in the more prominent branches of civil engineering. First dealing with the subject of waterworks he stated that, though water taken directly from rivers has of late years been regarded with suspicion, it was not improbable that rivers as a source of supply would again grow in favour, especially when the conditions of pollution and the safeguarding of the water by careful and efficient filtration came to be better understood and recognised. Many matters connected with water supply, which were unheard of at the commencement of the last century, are now of every-day occurrence, such as the treatment of certain waters with lime to prevent their action on lead communication pipes, the softening of hard waters, the construction of large depositing tanks to facilitate the deposit of matters in suspension, as well as to enable flood-waters to be passed by during the earlier stages of a flood, in cases where the water was taken directly from a river, service reservoirs (in many cases covered to protect the water from the action of light and heat, a precaution more especially needed with certain waters derived from wells or taken directly from rivers), and lastly, but not least, efficient filtration through sand filters, a mode of treatment first introduced by the late Mr. James Simpson in the year 1828. As there still existed much misconception in regard to the quantity of water required for domestic purposes with a constant service, unrestricted use, except in respect to misuse and waste, Mr. Hawksley stated that, having recently had occasion to collect statistics on the subject from sixteen of the principal towns in England, he found that the quantity of water distributed for domestic and other non-metered purposes was, on the average of six towns supplied by companies, having a total of 1,185,000 persons, 19 gallons per head per diem, and in the case of ten towns supplied by public authorities, and having an aggregate population of 3,961,000 persons, 18½ gallons per head per diem. The foregoing quantities provided a constant service for all domestic purposes, including unmetered trade supplies and such waste as cannot be prevented.

Passing to gas works, the President remarked that some idea of the development which had taken place in the size of gasworks might be formed from the fact that, whereas in the year 1822 Sir William Congreve, the Government Inspector of Gasworks, reported that at one of the London gasworks several of the gasholders were each "of the enormous size of 40,000 cubic feet," the London gas companies now possessed gasholders having capacities of from 8,000,000 cubic feet to 12,000,000 cubic feet each. Coal gas was now used not only as an illuminant, but also extensively for heating and motive power. Although for these latter purposes gas, as supplied to towns for illuminations, was mostly employed for the sake of convenience, there were many instances in which, from considerations of economy, a specially made gas of low illuminating power was used. The employment of gas of that nature was likely to become largely increased by the facilities and greater economy which doubtless would, before long, be afforded by the distribution of Mond gas, the manufacture and distribution of which had, during the present year, received the sanction of Parliament by the passing of the "South Staffordshire Mond Gas (Power and Heating) Company Act, 1901," having for its object the supply of gas (not to be used for illuminating purposes) in large quantities, at a price from 3d. to 4d. per 1,000 cubic feet.

It was at first anticipated by many persons that the competition of electricity would greatly reduce the value of, even if it did not utterly ruin, the coal-gas industry, but such had not proved to be the case, the effect of the introduction of electricity having been to reduce the rate expansion of gas undertakings. The competition of electricity had, moreover, proved a stimulus to improvements in the mode of consuming gas, such as the incandescent burner, and had led to greater facilities being offered to the gas consumer, as, for instance, by the prepayment meter and the letting on hire of cooking stoves.

With regard to electricity the utilization of electric energy had opened out an entirely new field for the employment of civil engineers, and had established a new branch of the profession which has to deal with a subject of so varied, novel, and interesting a character as to have led to the formation, in the year 1871, of the Institution of Electrical Engineers, which already numbered over 4,000 members of all grades, and which devoted its discussions entirely to electrical matters. The great advantages conferred on mankind by the development of electricity were accompanied by certain drawbacks. In the first place there was the undoubted disfigurement of British towns by overhead wires, a disfigurement which it sought to justify on the score of economy, a plea which was not, in his opinion, a sufficient justification, and one which was not allowed to prevail in some other countries less wealthy than Great Britain. The placing of the wires underground would not only prevent that disfigurement, but also remove the danger—not perhaps a great one, having regard to the comparative fewness of the accidents that occur—attending the use of overhead wires. There is a great opening in connection with electric tramways for a good underground conduit system which could be readily applied in this country. Unfortunately the heavy initial capital expenditure required for the present conduit system, as compared with that required with the overhead system, had prevented its adoption in all but a few isolated cases, but he was hopeful that British electrical engineers would turn their attention to this matter and evolve a conduit system which would greatly reduce the difference now existing between the cost of the conduit system and that of the overhead trolley system. It might be of interest to state that, although electricity was the youngest of the sciences, upwards of £130,000,000 of capital had already been invested in Great Britain alone in electrical undertakings.

Lastly, Mr. Hawksley referred to the want among manufacturers of a system of standardization—a very important point. For some time past the Council of the Institution of Civil Engineers had realised the serious difficulties and disadvantages under which British manufacturers were placed by the lack in the country of some acknowledged standards. The Council of the Institution of Civil Engineers therefore approached the Institution of Mechanical Engineers, the Institution of Naval Architects, and the Iron and Steel Institute, with a view to taking up this subject, and a strong and influential committee, representing these four institutions, was formed. The evidence laid before the committee was interesting, as showing the various methods in which the different countries carried out their work. For instance, in the United States, where the American Society of Civil Engineers has issued standard sections for rails and standard specifications, the rolling mill makers would in most cases only roll to those sections. It transpired that from time to time various enquiries had been sent to America from Great Britain for tenders for large quantities of rails and of other materials that were needed by British companies, but in nearly every case the reply was that "unless you take our standards we regret that we do not see our way to quote." On the other hand, some instructive instances of the waste of time and money that occurs in Great Britain for the want of standard sections were laid before the committee. One case in point was a section incorporated in a bridge for one of the British colonies. The average cost of the material was £8. 8s. per ton, but one of the sections specified was of such an odd size and the quantity of this size was so small that the section had to be made by a blacksmith at a cost of from £28 to £30 per ton. It was, therefore, with a view to lessen the cost of and to expedite the carrying out of the work designed by engineers, as well as to enable the British manufacturers to meet the keen competition which is now threatening even the home markets, that the Institution of Civil Engineers had taken in hand this important matter.

THE IRON AND STEEL INSTITUTE.

At the meeting of the Institute, held at Dusseldorf, a paper by Mr. A. Hannet of St. Etienne, on "The Compression of Steel by Wire-drawing during Solidification in the Ingot Mould" was read on the 4th ult.; Mr. W. Whitwell, the president, occupied the chair.

In this paper the object of the author was to point out a new method of compressing steel whilst still liquid in the mould in which the ingots are cast. When molten steel is poured into the ingot mould, which is of cast-iron, it may be changed in character, owing to various causes. During cooling the metal is subject to contraction, crystallization, and liquation, all of which may injuriously affect the character of the steel. When the metal begins to cool, it shrinks, so as to come away from the walls of the mould. There is a solid steel shell, which surrounds a mass of liquid metal. As the latter cools, it shrinks, and little by little during cooling the fluid steel becomes plastic and attaches itself progressively to the shell and leaving a hollow corresponding to the shrinkage. The still liquid metal flows down from the surface to fill these hollows, and, as the centre cools last, there is thus left a hollow space extending along the axis of the upper part of the ingot. The lower central part of the ingot also has porosities and tiny cracks, and fissures can be detected by the microscope permeating the whole mass. When the lower part of the ingot is solidified throughout its whole thickness, and as soon as the descent of the upper layers of liquid metal is interrupted, the shrinkage, proceeding as the cooling continues, sets up within the metal injurious stresses. Moreover the steel in solidifying forms into crystals which have little cohesion between themselves, and, when stresses due to contraction within the metal are set up, these meet with but low resistance, and cracking occurs easily.

The metalloids which enter into the composition of the steel have a tendency to separate from the iron by liquation. The carbon, being the most mobile, is attracted towards the fluid parts, finally concentrating where solidification last takes place—that is, at the head of the ingot. The ingot as cast may therefore be useless, and recourse has to be had to mechanical treatment, by rolling or forging, to correct defects, the cracks and fissures rewelded, the stresses relieved, and the crystals reduced to a fine state. The upper end is cropped to waste. In order to overcome these defects in steel which may be, as it comes from the furnace, of good composition, the author effects compression on the steel whilst it is in the mould by wire-drawing.

It should be stated that the late Sir Joseph Whitworth introduced a system of putting steel under pressure whilst liquid in the mould, but in that case the pressure was exerted from the top. The author claims that his system possesses certain advantages over the older methods. He states that, in spite of the great force of the pressure applied, the effect only extends to the exterior of the ingot, which, on cooling, rapidly forms a crust with the rigidity of a column and thus arrests the force applied and protects the central part. The method may answer for hollow pieces, but is ineffective for solid bodies such as armour-plates. In the author's system pressure is applied by means of an hydraulic press to the bottom of the ingot whilst it is liquid in the mould. It should be stated that the ordinary ingot mould is open at the top and the bottom, and that it tapers towards the top, so that the upper diameter is less than that of the lower part. By applying pressure from below, the ingot, which has shrunk on cooling, is thrust upwards into the smaller part of the conical mould. The cooled shell thus presses on the central part, and the hollows due to shrinkage are not free to form. By hastening the solidification in this way the tendency to coarse crystallization is counteracted, and the tendency of the carbon to accumulate is lessened. The reason the author describes this action as wire-drawing is that the pressure applied at the base causes the metal to rise in the conical mould as though being forced through a draw-plate, as wire is drawn. The paper stated that with this method production is increased 25 per cent.

A paper by Mr. D. Selby-Bigge on "The Application of Electric Power in the Iron and Steel Industries" was next read by the author. This paper gave some interesting and valuable particulars of certain installations of electric machinery for the transmission of power which had been erected in various works. These may be briefly stated as follows:—At Hamburg a Brown single steam crane cost, per ten-hour run, 10s.; a steam winch-crane, 8s.; a steam crane driven through pipes, 12s.; and an electric crane, 7s. The cost per ton lifted by 182 steam cranes was 2½d.; by the electric crane the average was 1d. In the Westinghouse Company's works a reduction in coal consumption of over 32 per cent. was made by the adoption of electric transmission, the engines being Parson's steam turbines.

An article by Mr. Richardson on Vickers, Sons, and Maxim's works, which appeared in the July number of *Traction and Transmission*, was quoted, in which it was said that the saving due to the use of electric transmission of power was probably nearer 60 per cent. than 50 per cent. In a colliery a sum of £1,500 was saved per annum at one shaft by pumping by electric motors. In another colliery, where the pumps were originally driven by endless wire rope, the expenditure of a little over £3,000 in electric plant resulted in the annual saving of from £1,500 to £1,800. A similar case was quoted of a Scottish colliery, and other details were set forth as to cost of labour and material for driving by electricity and other means of transmitting energy, all more or less in favour of the former.

In a later part of the paper the author dealt with the importance of utilizing the waste gases from blast furnaces. Gas engines have been driven in this way, and these should be made to actuate blowing engines or dynamos from which current could be distributed throughout the works. At Seraing a Cockerill gas engine of large size used about 100 cubic feet of average blast furnace gas per effective horse-power per hour. This was less than one-fourth of the gas that would have been burnt in the boilers of good modern condensing steam engines. It is estimated that for every 100 tons of coke used in an ordinary Cleveland blast furnace there is a surplus of at least 1,500 horse-power. "It would be impossible," the author said, "to overrate this new development in power production. In Great Britain really large sources of water-power are practically unknown, and the sources from which electricity can be produced most economically will be undoubtedly due to the development of large power gas engines making use of the surplus gases from the blast furnaces, which would otherwise be wasted. Engines have been constructed, and are at work, of 1,200 horse-power, and an engine of this type is now building for no less than 2,500 horse-power."

In the concluding part of his paper the author dealt with the development of electric power companies, and the prospects of electric enterprise in this country. In regard to general supply from central stations by public companies, he considered that often "the matter had been rushed into somewhat precipitately." In a district of a fairly concentrated character or in which a large number of small works and factories exist, it might be profitable for the works to take 100 to 200 horse-power at 1d. per unit. In districts where all the works are of an extensive character, and absorb 500 to 5,000 horse-power, it would be more profitable for works' owners to produce their own power. With the best modern plant generating stations of 400 horse-power and upwards the cost of production should not exceed ½d. per Board of Trade unit, inclusive of depreciation and interest on the capital outlay. With blast furnace waste gases this figure would be less.

In concluding, the author referred to the slowness with which Great Britain had made use of the advantages which electricity supplied, and the obsolete nature of much of the engineering plant of the country. He contrasted this with the enterprise of Germany and America, and attributed the greater activity of the latter country to the greater latitude and power vested in the general manager as contrasted with "the small scope of initiative action allotted to the works' managers (in England), nearly every innovation and improvement being referred to the board of directors."

THE BRITISH ASSOCIATION.

During the recent meeting of the British Association at Belfast, an interesting paper was read on the 12th ult. in the Geographical Section, by Major P. Molesworth Sykes, C.M.G., first British Consul in Eastern Persia, which dealt with the geography of Southern Persia as affecting its history, and introduced an account of the Helmand Delta and the great desert of Persia, known as the Lut. The following is an abstract of this paper:—

Southern Persia and Baluchistan were situated between the rich alluvial plains and ancient civilizations of the Euphrates, Tigris, and Kárun on the west, and that of the Indus on the east. Washed throughout to the south by the Persian Gulf and Arabian Sea, the country maintained a low level for a considerable distance inland, and the heat in summer was terrific. Additional disadvantages were the absence of good harbours, and the fact that in the Persian Gulf there was always either too much or too little wind. This coast trip ran back to range after range of rugged mountains, increasing in altitude until the Irán plateau was reached.

The fertile zone of upland country was not very wide, and it soon decreased in elevation, sloping down to the paralysing waste of the Lut. In its east and west aspect, from the Tehrán-Isfahán-Shíráz-Bushíre road eastwards the Lut stretched right across the entire width of Persia, thus separating the land of Irán into two divisions far more effectually than any sea or mountain barrier.

Southern Persia and Baluchistán had ever been comparatively barren countries, most difficult of access from the coast, and consequently had always escaped invasion by sea. Owing to the hardening influence of a livelihood gained from a sterile soil, and perhaps still more to the superb climate, a warlike race was produced, which frequently held in subjection the inhabitants of the rich low-lying plains to the west, while more than once the martial hosts of Irán had swept all before them in the plains of India.

Concerning the variable lower course of the Helmand, the author gained some interesting details when travelling in Sístán nearly four years ago. Sístán was not only fed by the Helmand, the classic Etymander, but its waters formed the lagoon in which this interesting river discharged. In the 14th century there was a solid dam, known originally as the Band-i-Rustam and later as Band-i-Akwa (evidently a corruption of Afghan or Agwan). This was situated at a point on the Helmand, some 40 miles east of the ruins of Hauzdár, and at an equal distance from the limits of Sístán as it was to-day. A deep canal running west irrigated the fertile plain of Hauzdár, the main stream flowing north under the name of Rud-i-Nasru. On its banks were the famous cities of Shahristán and Zahidán.

Towards the close of the 14th century Sístán was invaded by Timur or Tamerlane, who destroyed the dam, and thus reduced the Hauzdár plain to a waterless desert. The Helmand, while still keeping to the Rud-i-Nasru, created a second branch encircling Schkuha, which had not hitherto been inhabited.

There was apparently no other change until early in the 19th century, when the whole volume of water united to carve out a channel further east, to the west of the village and mound of Nád-i-Áli. As cultivated Sístán was thereby left high and dry, the Rud-i-Sístán was cut a little to the north of Schkuha—a task of great magnitude. This was the state of affairs when Sir Frederic Goldsmid made his award; but in 1896 the Helmand began to forsake the Nád-i-Áli Channel, and struck out a new course between it and the Rud-i-Nasru. This was now known as the Rud-i-Perián, which was a fine river when the author crossed it on a reed raft in 1899. It was anticipated by the greybeards of Sístán that the wayward Helmand would finally return to the ancient Rud-i-Nasru.

The Lut, undoubtedly the salient characteristic of Persian physical geography, was believed to have been in early time an inland sea, which theory was supported by the presence of the active volcano of Sharhad, the extinct volcano of Bazman, and many legends. Careful enquiry had led the author to believe that the name Lut properly applied to the whole of the great desert of Persia, including the so-called Dasht-i-Kavir in the north and the Dasht-i-Lut in the south, and that its saline portions were known as Kavir, which was undoubtedly the Arabic word *kafr*, signifying a saline swamp.

As regards the term Lut, the guides pointed out fantastic bluffs, resembling forts, mosques, or cathedrals, and explained how they were ruins of cities which the Almighty destroyed, as was the case with the cities of the plain, from which Lot escaped with so much difficulty. It would seem that this great waste of Persia had become associated (most appropriately) with the name of Lot, Abraham's nephew. The author finally made some remarks on the trade routes and on the telegraph line which was being constructed across Persia, showing how in every case direction was determined by geographical features.

The president, Sir Thomas Holdich, in offering the thanks of the meeting to Major Sykes for his paper, said he wished to emphasize the importance of keeping an eye on the geography of that part of the country dealt with which included Sístán. The map showed the difficulty of approaching India from any possible side but the west or north-west. That was the key to most of the approaches to India, a side from which military advances had been made which had changed the destinies of the whole of the north of India. Great interest had been shown lately in the proposal—the sanctioned proposal—to construct a railway between Quetta and Nushki. There might be some reason for apprehension that it was intended to carry the railway a little further, but there need be no apprehension on that point at present, because Nushki, being on the edge of the desert, formed the best terminus for the caravans between Sístán and India.

Another point to which he wished to refer was the construction of a new telegraph line to connect Teheran presumably with Quetta. No doubt the maintenance of such a line would cost far less than the maintenance of the present line by the coast to Karachi; but he could not help thinking that it would be a great mistake to abandon the latter line. The present route necessitated the maintenance of a telegraph steamer, and that introduced a certain number of British officers to various ports in the Persian Gulf, which would not otherwise be visited by them. The presence of that steamer was no doubt a very important political factor. It was tolerably obvious, too, that a line running along the coast was very much more easily reached than a line that was run into the interior, and it was a well-known fact that whenever local disturbances arose in Persia the first thing the people did was to make for the nearest telegraph station, and it was inconceivable that matters in that part of the world had arrived at such a point of development that such things would not occur again. If the line in the interior were destroyed, it would be very difficult to restore it without the assistance of a considerable body of troops. A coast line, on the other hand, could always be repaired easily.

British Trade with Bulgaria.—The reports of various British consular officers in Bulgaria show a material improvement in British trade there. The imports from Great Britain increased from £301,150 in 1900 to £556,675 last year, and the exports to this country from £239,665 to £635,013. The increase in Manchester fine goods was very marked, and there was also a large increase in yarns. Chemicals and iron were also sent in larger quantities. The Johnstone line of steamers have come to an arrangement with the Bulgarian railways which has led to considerable reductions in the charges for British goods, and to a system of through rates from manufacturing centres in Great Britain to inland places in Bulgaria and Eastern Rumelia. Textiles, for instance, now pay 6s. per 220 lb. from Manchester to Philippopolis, *via* Bourgas. At Varna, British imports last year were double those of 1900, which, however, was an extremely bad year. The chief competition with British cottons comes from Italy. The Italian manufacturer is described as very active and enterprising. He spares no pains to study the wants and means of his customers, and has thus broken down the virtual monopoly Manchester once enjoyed.

COMMERCIAL INTELLIGENCE DEPARTMENT.

CORRESPONDENCE AND ENQUIRIES.

The following are given as specimens of some of the enquiries which have been addressed to, and satisfactorily answered by, the Institute during the past month (September).
* * *All communications must be authenticated by the name and address of the writer. Enquiries which would involve special applications or expense will be a matter of arrangement with the correspondent.*

Board of Trade, London.—Particulars of the coal and coalfields of South Africa.
H. H. M.—Rates of wages of stonemasons in Melbourne and Montreal.
J. S., Somerset.—Climate of Georgetown, British Guiana.
H. & Sons, London.—Kinds of carriages used in Mauritius.
E. B. & Sons, London.—Methods of manufacturing certain picture frame moulding.
M. & F., London.—Vanilla cultivation.
R. M. & Co., Birmingham.—Coffee- and sugar-planting in Queensland.
W. & C. P., London.—Manufacturers of cement, flour, sugar, and packers of fish, in the Colonies.
V., London.—Imports of petroleum into Newfoundland.
S. A. C., London.—Banana cultivation in the West Indies.
F. A. G., London.—Export trade of Ceylon.
R. H. J., London.—Customs Tariff of New Zealand.
E. A. E., London.—Rubber and castor oil, cultivation of plant, collection and preparation.

REQUIREMENTS REGISTRY.

In order to provide correspondents with an opportunity of making known special "wants" or "needs" in the British Colonies, India, and Foreign Countries, space will be regularly devoted to the publication of approved notices in the *IMPERIAL INSTITUTE JOURNAL*. Notices, as a rule, should not exceed 25 words in length, for which a charge of 2s. 6d. will be made for each insertion. Special arrangements can be made for longer notices.

SPECIMENS OF FOREIGN AND COLONIAL WOODS desired. Purchase or exchange. Names and localities must be well authenticated. Address—HERBERT STONE, BRACEBRIDGE-STREET, BIRMINGHAM.

THE CURATOR OF THE CANADIAN SECTION OF THE IMPERIAL INSTITUTE is prepared to furnish information about Canadian Trade and to supply names of importers, manufacturers, shippers, etc.

The following trade enquiries have been received at the Canadian Section of the Imperial Institute, from the Curator of which Section further particulars may be obtained:—

Home Enquiries.—A London firm wishes to hear from Canadian shippers of Melpeque and Caraqueet oysters.

A London house asks to be placed in communication with Canadian producers of pulp board used for making boot and shoe soles.

A manufacturing firm is prepared to appoint suitable Canadian resident agent for the sale of paraffin specialties and other druggist wares.

An enquiry has been received for the names of Canadian shippers of caviare.

A London firm wishes to secure one or more agencies of Canadian producers of manufactured building supplies.

Canadian Enquiries.—A Toronto firm asks to be placed in communication with United Kingdom importers of honey and maple syrup.

A correspondent in the maritime provinces seeks agencies in liquors, tobacco, pipes, etc.

MAPS AND CHARTS.—RECORDS.

[The entire collection of maps (with the exception of a few atlases and maps issued by private firms) consists of authoritative publications of the various government cartographical departments. Such as: the One-inch Ordnance Survey of Great Britain and Ireland, a complete set of Admiralty Charts, and a selection from the maps compiled in the Intelligence Division of the War Office; the monumental "Indian Atlas," and a large number of the publications of the Surveyor-General's office, Calcutta; the Geographical Survey of Canada, and the Government Surveys of Victoria and New South Wales. In the arrangement of the collection, the geographical classification of the War Office Intelligence Department catalogue has, with some modifications, been followed.]

ADDITIONS TO THE COLLECTION OF MAPS DURING SEPTEMBER, 1902.

AFRICA.

BRITISH CENTRAL AFRICA, No. 1479, provisional, 9 sheets.

EAST AFRICA, No. 1539:—North-east Somaliland, South-east Somaliland, and South-west Somaliland.

EGYPTIAN SUDAN, No. 1489:—Debba, Merowe.

Presented by the Director-General of Mobilization and Military Intelligence.

CHARTS AND PLANS.

Published by the Hydrographic Department, Admiralty, during July and August, 1902:
J. D. POTTER, Agent, 145, Minorities, London, E.C.

New Charts.

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|------|---|--|
| No. | | |
| 3275 | Ireland, west coast:—Blacksod bay. | |
| 1458 | Spain:—Ports and anchorages on the east coast of. Plans added:—Cullera anchorage, P. Dénia, Benicassim road, Columbretes islands. | |
| 3276 | Balearic islands:—Iviza and Formentera islands and channel between Iviza and Espalmador. | |
| 3277 | Balearic islands:—Ports San Antonio and Iviza. | |
| 3259 | Newfoundland, east coast:—Green head to Little bay island. | |
| 3270 | Newfoundland:—Head of Fortune bay, including long harbour. | |
| 3204 | United States, east coast:—New York bay and harbour. | |
| 3286 | South America, east coast:—Rio de San Francisco do Norte to River Tariri. | |
| 3260 | British Columbia:—Johnstone strait. | |
| 3284 | India, west coast. Gulf of Kutch:—Salaya harbour. | |
| 3296 | Eastern archipelago. Plans in Timor:—Koepang bay and approaches, Koepang road, Hansisi anchorage. | |
| 3294 | Yang tse kiang:—Hankau. | |
| 3163 | Japan, south-east coast:—Nipon island, Katsura wan. | |
| 199 | Adriatic:—Brindisi to Ortona. New plan:—Vieste. | |
| 421 | Newfoundland:—Plans on the east coast of. Plan added:—Toulinguet harbours. | |
| 2141 | Newfoundland, south coast:—Richards harbour to Ramea island. Plans added:—Heads of White Bear, Hare, and Rencontre bays. | |
| 3016 | Newfoundland, west coast. Cow head to Rich point. Plan added:—Bad bay. | |
| 220 | Newfoundland, north-west coast. Savage cove to St. Barbe bay. Plans added:—Flower cove, St. Barbe harbour. | |
| 2923 | Australia, east coast. Hope islands to Turtle group. New plan:—Cook's passage. | |

Charts that have received additions or corrections too large to be conveniently inserted by hand, and in most cases other than those referred to in the Admiralty Notices to Mariners.

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| No. | | No. | |
| 1828 | England, east coast:—The Downs. | 24 | South America. Chile:—Channels between Gulf of Trinidad and Gulf of Peñas. |
| 2693 | England, east coast:—Orwell and Stour rivers. | 2840 | British Columbia:—Haro strait and Middle channel. |
| 2053 | Ireland, south coast:—Kinsale harbour and Oyster haven. | 1835 | British Columbia:—Clayoquot sound. |
| 2745 | France, west coast:—Île de Bas and adjacent coast. | 1844 | Borneo:—Labuan island. |
| 710 | Spain. Anchorages on the north coast:—Port Castro Urdiales. | 3148 | Celebes:—Salabangka strait. |
| 2233 | Black Sea: Sheet IV:—Sevastopol to Kertch strait. | 999 | Gulf of Siam:—Menam Chau Fya or Bangkok river. |
| 2205 | Black Sea:—Kertch strait. | 1258 | Korea:—Approaches to Séoul. |
| 2978 | Iceland:—Sigle fiord to Niardvig. | 2265 | Japan:—Kobé and Hyogo bays. |
| 2979 | Iceland:—Niardvig to Storksnes. | 1011 | Russian Tartary:—Eastern Bosphorus strait (Hamelin strait). |
| 2980 | Iceland:—Storksnes to Portland. | 2130 | Tasmania:—Port Davey. |
| 2042 | North America Gulf and River St. Lawrence:—Sydney harbour. | 2922 | Australia, east coast:—Turtle group to Claremont point. |
| 2579 | Cuba, western portion. | 1896 | New Zealand:—Auckland harbour entrances. |
| 495 | Martinique:—St. Pierre roadstead. | 1423 | New Zealand:—Port Nicholson. |
| 892 | South America, east coast:—Macao to Rio de San Francisco do Norte. | | |

THE COAL AND COALFIELDS OF SOUTH AFRICA.

CAPE COLONY.—The coal-producing areas may be divided into four districts. The first district comprises the largest coal-mine in the colony—the Indwe Mine, owned by the Indwe Railway Colliery and Land Company Limited, which furnishes about half the total output of the colony. It is connected with the main railway line at Sterkstroom by a branch, 66½ miles in length, built by the company. The second largest producing district comprises the mines of the Cyphergat Coal Mining Company, Limited, the Wallsend Colliery Company, Limited, the Fairview Coal Mining Company (operations are suspended here at present), and the Sterkstroom Mines, where not much work has been done as yet. The third district comprises the mines in the Molteno district; Penshaw and Paardekraal mines are worked by the Penshaw Collieries, Limited, the others are owned by private individuals. Molteno No. 1 has been worked for many years, and has produced considerable quantities of coal. It is connected with the railway by a short line built by the owner of the mine. Sieradzfontein Mine is close to Molteno No. 1, and in 1898 had the largest output in the district. Penshaw is close to Molteno, and Paardekraal is about three miles to the south-west. The fourth district is the smallest, and includes:—(a) the Romansfontein, which is a private mine twelve miles south-west of Molteno, and six miles from the terminus of the Cape Collieries Railway (the carriage to Molteno, 5s. per ton, is a great drawback, and hinders the output very much); (b) The Mines of the Cape Collieries, Limited, whose principal work is on the farm of Zeekoegat. Other mines of this company are the Speedwell and Silkstone collieries on the Zandfontein farm. The company has built a railway of 17½ miles to the main line four miles west of Stormberg Junction; (c) Contat's collieries have been idle for some time, the company being in liquidation.

NATAL.—The coal deposits of Natal are situated in the extreme northern portion of the colony, the southern limit being a line drawn east and west about twelve miles north of Ladysmith. Outside this area coal has been found in small quantities near Estcourt, and on the coast northward from Mount Edgecombe, but up to the present only in thin seams of no practical value. In the northern district the deposits lie almost horizontally from 3,800 to 4,000 feet above the sea level. On the other side of the mountains coal has been found near Charlestown and at Volksrust in the Transvaal. About a dozen seams of coal have been discovered, but only four or five of these are workable. The Dundee district is at present the best developed area, and here the seams go up to four feet six inches in thickness, and yield coal of good quality. Further north, between Dundee and Ingagane, prospecting operations have revealed seams of good coal up to six feet in thickness which were just being developed previous to the war. In the Newcastle district, both the quality of the coal and the thickness of the seams are very variable. The principal producing mines are the Dundee collieries, Natal Navigation collieries, those of the St. George's Colliery Company, the Elandslaagte collieries, and the Natal Marine collieries.

RHODESIA.—The coalfield is situated some 180 miles north-west of Bulawayo, and is known to extend over 400 square miles. The seams vary from five to sixteen feet in width, and as the coal lies within forty feet of the surface it will be worked by means of inclines instead of shafts. In so large an area the quality naturally varies, but it is claimed that the coal is better than that now in use in the Cape Colony, Natal, and the Transvaal.

ZULULAND.—Coal prospecting has been carried on on the coast of Zululand to the south of the Umlalazi river. Almost all the work has been done by one of the Government drills. The results cannot, so far, be termed satisfactory.

No sections of bores can be obtained in England at present. Several illustrations of sections of bores for coal in Natal may be seen in the report on the Mining Industry of Natal for the year 1901. Outcrops are mentioned on the Indwe, Cyphergat, Penshaw, and other fields.

The following are some analyses of Natal coals:—

	Fixed Carbon.	Volatile Matter.	Sulphur.	Ash.	Moisture.
Dundee coal, No. 1	70'53	16'63	4'18	12'41	0'44
„ „ No. 2	71'85	9'37	3'83	13'09	1'56
Newcastle	60'94	31'20	0'74	6'23	1'63
Navigation collieries—					
No. 1 top seam	80'98	8'44	1'64	8'38	0'56
No. 1 bottom seam	80'37	9'69	1'72	7'70	0'52
No. 2 top seam	76'37	14'67	1'37	8'30	0'66
No. 2 bottom seam	71'59	15'17	1'30	12'71	0'53

The following figures represent the amount of the different South African coals required to do the same work as one ton of Welsh coal. They are from official trials, and were communicated to the Cape Government Commission on railway coal:—

	Tons.
Welsh coal (Ocean Merthyr)	1'000
Viljoen's Drift (Vereeniging)	1'562
Indwe	1'634
Cyphergat	1'729
Wallsend (Cape Colony)	1'502
Molteno	1'706
On the same basis,	
Natal coal has been estimated at	1'102

The output of coal in Natal for 1901 shows a great increase on the output of the last working-year's record (1898). The figures for the last five years are:—1897, 243,960 tons; 1898, 387,811 tons; 1899, 328,580 tons; 1900, 241,330 tons; and 1901, 569,200 tons.

The export of coal from Natal in 1901 amounted to 204,788 tons, of which 55,757 tons were exported from Durban by sea, 1,865 tons overland to Orange River and Transvaal colonies, and 247,166 tons were bunkered by vessels at Durban. The total output of the collieries being 569,200 tons, it will be seen that 264,412 tons were either consumed or stocked in Natal. 146,234 tons of Colonial coal were consumed on the Natal Government railways during 1901.

The output of the Cape collieries in 1898 was 191,858 tons.

The development of the coal areas and prospecting for new deposits is going on steadily.

The largest market for coal in South Africa is that of the Witwatersrand Goldfields. For the coal of Natal, the bunkering trade of Durban has furnished the largest market up to the present, the Natal Government railways being the next largest consumers. The demand in South Africa for its coal is equal to the supply. Nearly all the mines can readily sell all the coal they can produce, and most of them would increase their output if labour were more plentiful. Many of the companies suffer from the scarcity of labour.

The railway system, on the whole, affords fair facilities for the development of the coalfields.

The Committee on coal for railway purposes in 1899 recommended a reduction of the tariff for conveyance of colonial coal in return-empties coastwise from the rate of ½d. to ¼d. per ton per mile from Stormberg to East London, and from Rosmead to Port Elizabeth and via De Aar to Capetown, and the rate of ½d. per ton per mile to operate only for the distance from Sterkstroom via Stormberg Junction to Rosmead Junction; and that all these rates should be also for intermediate stations en route to the ports. They did not recommend a reduction of the existing rate for coal northwards. In making these recommendations the

committee were of opinion that, if accepted, they would lead to the use of Colonial coal in a very considerably greater degree and for a great many more new purposes than it had been used, and would add to the net revenue of the Colonial railways and would enable the consumer to obtain Colonial coal at a cheaper rate.

The following are some notes, from the report of the Committee of the Cape Parliament on the use of Colonial coal on Colonial railways, which reported in 1899.

It appeared that there was a disposition on the part of the Locomotive Department of Colonial railways in favour of the exclusive use of Welsh and Viljoen's Drift (Transvaal) coal. The descriptions of coal in use in 1899 were Indwe (84,000 tons), Stormberg (54,000 tons), Viljoen's Drift (120,000 tons), and Welsh Ocean Merthyr (106,770 tons). Colonial coals were used with economical advantage for railway purposes, as against imported coals, at East London. Colonial coal could also be used with economical advantage over Welsh coal at Port Elizabeth, but for running passenger trains up to time a mixture of two-thirds of Colonial with one-third of Welsh coal was more economical than the use of Colonial coal alone. Colonial coals could not be used with advantage over imported coal at Cape Town. It was anticipated that in the near future Natal coal would be delivered at Port Elizabeth and Cape Town at a price comparing favourably with Welsh coal; in such case the Committee recommended that Natal coal should be taken in preference to Welsh coal. In connection with the Cape Collieries Company's private line of railway, the committee were of opinion that with the view of encouraging the coal industry and of securing to the public of the district through which the line runs the advantage of said railway, steps should be taken to ascertain if the Company was prepared to grant a reasonable tariff, in which case the committee recommended that the Government should grant a subsidy on the same conditions as in former subsidies to private lines.

The following particulars of the coal and coalfields of the Transvaal and Orange River Colony, are taken from Brown's *Guide to South Africa*, published by Messrs. Sampson Low, Marston and Company, Limited.

TRANSSAAL.—A good seam of coal is being worked in the south-west at Klerksdorp. The discovery of a large deposit of excellent quality at Sypherfontein in the West Rand, about 12 miles from Roodepoort and 18 from Johannesburg, was reported early in 1898. Further to the east, at Vereeniging, are the collieries from which the greatest part of the fuel used on the Cape railways is derived. The coal is supplied at the pit's mouth at about 10s. per ton, and during 1898, 287,640 tons were produced. The clay underlying the coal, which lies about 80 feet below the surface, is suitable for making fire bricks. At Waterval, 12 miles north of Pretoria, a large deposit was proved in 1897. The supply is estimated at 45,000,000 tons, and the bore-hole showed that between the second and third seams of coal lay an auriferous bed of grit impregnated with pyrites, which gave an assay of 11 dwts. of gold to the ton. The district from which the chief supply on the Rand is derived is that discovered in 1887, and extending from Boksburg on the west to the Springs on the east, sixteen and thirty miles respectively from Johannesburg, with which they are connected by railway, a second line leading from the collieries to the deep level gold mines being in course of construction. Some eleven companies are working at Boksburg, with a yearly output of about 1,300,000 tons, sold at the pit's mouth at from 6s. 4d. per ton. The coal bed is close to the gold-bearing reef, which it is even said to overlap. Six miles to the east of Boksburg is Brakpan, worked by the Coal Trust Company, and by far the largest colliery in South Africa. A coal area of 2,400 acres, with a seam averaging 20 feet through, has been proved by boring, and the coal is singularly clean. It is capable of an output of 1,000 tons a day, and produced 248,383 tons in 1898. Seven miles to the east of Brakpan is the Springs colliery, formerly owned by the Netherlands Railway Company. This is also a most extensive mine, with a seam varying from forty to fifty feet in thickness. It is fitted with first-class machinery, and turned out 158,458 tons in 1898. Near the Springs is the Cassel colliery, with an output of 255,092 tons for 1898, and power to produce about 60,000 tons a month. The Great Eastern colliery yielded 184,806 tons.

It is said that the coalfields near Middelburg in the Transvaal, through which the Pretoria-Delagoa Bay railway passes, will prove to be the best in quality and the most extensive known, and will lead to a large export trade from Delagoa Bay. The output for 1896 was 69,164 tons; and for 1898, 305,150 tons. Coal is also said to exist near Pietersburg. The total output of the Transvaal for 1895 was 1,152,206 tons; for 1896, 1,471,189 tons; for 1897, 1,618,077 tons; and for 1898, 1,953,026 tons. The returns make no allowance for slack.

ORANGE RIVER COLONY.—Coal will probably be worked later on in many parts of this colony. It is known to exist near Bethulie, also 12 miles to the north-east of Bloemfontein, and is being mined near Kroonstad and Heilbron, also at Viljoen's Drift to the north of Vaal river. Shafts lately sunk to the south of the Vaal have intersected the seams found to the north of the stream, but at a depth nearly four times as great.

BICYCLES AND AUTOMOBILES IN JAPAN.

In a recent report, the U.S. Consul-General at Yokohama says that the importation of bicycles into Japan has more than doubled in the past two years, the value of the imports in 1901 being £53,805, over 95 per cent. of which came from the United States. The bicycle has not yet penetrated into the interior of the islands; it is used chiefly as a cheap method of locomotion in the seaports and large cities. Being employed principally for business rather than for pleasure, it is not subject to the caprice which caused such an extraordinary increase and decline in its use in America. The demand for bicycles in Japan is likely to grow for some time yet, after which it may be expected to continue fairly steady. For the first five months of this year, the imports of wheels show an increase of 16 per cent. over the corresponding period of last year. A cheap wheel costing from £2 10s. to £5, finds most favour. Some bicycles for the troops have been manufactured at the Government works, and, as the Customs tariff on bicycles and automobiles is not conventional, the Government may, if it seem desirable, assist home industry by another schedule unfavourable to foreign makers; but there is no present indication that this will be done. A few motor bicycles or tricycles are seen on the streets, but they are not at all common.

According to the most reliable information that has been obtained, thirteen automobiles have, to this date, been shipped to Japan, but most of these still remain in the hands of the importers, who use them chiefly for advertising purposes. Automobiles are not named in the tariff schedules, but those brought here have been classed as carriages, which pay a duty of 25 per cent. There are no regulations for their operations and use, except as they came under the head of "steam plants," which can be operated only by a licensed engineer. This law has not yet been enforced against automobiles, but it is expected that it will be, should their use become more general, and especially if there should be any flagrant abuse of their privileges by the operators.

The Japanese are not a wealthy people, nor are they, even when possessed of wealth, much given to costly, extravagant or ostentatious forms of pleasure, and it is improbable that the automobile will ever become the toy of fashion or the mere pleasure vehicle that it is in Europe and America. Besides this, the country roads are too poor, and the city streets too narrow and too crowded with children—who, in most cases, have no other playground—for automobiling to be indulged in freely and with pleasure.

On the other hand, there is a fair prospect that automobiles may gradually come into use for the purposes of business. The postal authorities are now considering the advisability of purchasing automobiles for the transportation of the imperial mails at Tokyo. The mails are

now carried in waggons and carts, each drawn by a single horse. The Government must keep several relays of these horses, which are a continual source of annoyance and expense. Should the postal authorities decide to buy automobiles, those that are run by steam would be considered objectionable because of the real or fancied danger of fire to the imperial mails. At present, gasoline is exceedingly expensive here, but plans are in progress for its manufacture in this country. If these plans prove successful, gasoline will undoubtedly become as cheap as in America, and its use for generating motive power will increase rapidly. There are only a few street railways in Japan, some of which are electric lines; the others employ horse cars. An enterprising promoter might find it possible to establish a public automobile service, which, until additional street-car lines are built, would meet with no competition except from jinrikshas.

SIERRA LEONE.

The report of the Colonial Secretary of Sierra Leone for the past year is satisfactory. The revenue was much greater than that of any previous year, amounting to £192,138 (of which more than half was derived from Customs duties); the expenditure (£173,457), too, was greater than usual, owing to the liberal policy adopted in public works in the protectorate. The value of the imports was £548,286, and of the exports £304,410, this being a decrease, as compared with the previous year, in both cases. In exports this decrease amounted to about 13 per cent., because of a falling off in palm kernels and rubber. The product of the latter grows less, owing to wasteful methods of collection. The cost of transport of palm kernels has affected that trade, but the completion of the railway will revolutionize it, and bring to the coast thousands of tons of kernels which are now allowed to rot. The kola nut trade has also fallen in consequence of low prices, due to the supply being greatly in excess of the demand.

Two causes affecting the general trade of the colony are the severe restrictions placed on produce from the French sphere, whereby the Sudan trade—a large asset in former years—is gone, and the disturbances in 1898, from which the people are only now recovering. Nevertheless trade is in a healthy state, and will be largely increased by the railway, so that “the condition of the country is distinctly promising.”

An interesting paragraph of the report deals with Mahomedan education, a special department having been formed last year to deal with this subject in the colony and protectorate. Four schools have already been opened at Freetown, and Mahomedans are earnestly availing themselves of the opportunities thus provided. Suitable teachers are greatly needed, and special efforts to train a sufficient number are being made. “The Mahomedan question is regarded by the Government as one of the most important in the future of West and Central Africa. If Islam is properly understood, if its youth, inoculated with British civilization and British ideas, are utilized by British administrators and merchants, it will give to England a wider and more permanent influence upon the millions of the Sudan than can possibly be wielded by any other agency.

The population last year was 76,655. At the end of the year 76 miles of railway were open for traffic, with 13 stations. The work of extension is proceeding steadily. In tours made during the year the Governor found “absolutely no sign of either poverty or discontent,” the people appearing to have enough of the necessities of life “to allow them, for the most part, to loll in their hammocks all day and to dance and sing all night.” He found large tracts of land untouched, and reports that the whole country, from an agricultural point of view, was capable of great development. There has been no difficulty in collecting the house tax, and the amount does not go into the general revenue, but is spent for the benefit of the districts in which it is collected. “In every direction there are signs that the wealth of the country is growing and that there is a steady and normal progress. Means of transport, by the railway and better roads, have been improved and extended. Slavery is virtually defunct.”

THE TRADE OF ZANZIBAR.

The latest report by the British Vice-Consul at Zanzibar shows a material improvement in the trade of that island. Zanzibar maintains its position as an important trade centre, and has not been ousted from it by the growth of its main rival, Mombasa, in spite of the impulse given to the latter by the Uganda railway. The total imports last year amounted to £1,196,831, and the exports to £1,168,518, being in each case an increase over the previous year. Of the imports British India sent 35 per cent., German East Africa 22, the United Kingdom 10, and British Africa over 7 per cent., while of exports German East Africa took 35 per cent., British India 12, British East Africa nearly 12, and France over 11 per cent., while the United Kingdom took about 7½ per cent. Of the imports, piece-goods formed a quarter, bullion, rice, and ivory coming next in importance; while in exports, piece-goods were a little less than quarter, cloves, bullion, copra, and ivory coming next. The ivory trade improved considerably, owing to accumulations in the interior, through a scarcity of porters, having been brought down to the coast by the railway. About a quarter of the Zanzibar ivory goes to Bombay and Hong Kong. The Vice-Consul mentions that the ivory which makes its way down the Congo and so to Belgium is as different from the East Coast ivory as ebony is from mahogany. The tusks from the Zanzibar *hinterland* are by nature much softer and more easily worked. The softest ivory comes from the Benadir coast, and is said to be unrivalled in the world. The piece-goods trade improved through the excellent grain crops and consequent prosperity of the population on the mainland; the imports from the United Kingdom participate, to some extent, in this improvement, but the imports from Holland chiefly benefited. Dutch spinners appear to supply the ordinary dress of the Suahili men and women, the demands for which were specially large last year because of the prosperity of the agriculturists. German trade declined slightly, while that of the United States increased, mainly in piece-goods. The Vice-Consul considers that one important element in the maintenance by Zanzibar of its commercial position is that there is direct communication with London by the Eastern Telegraph Company's cables; Mombasa, which is north of this island, is not directly connected, but has only a branch cable.

Artesian Irrigation in Queensland.—The following extract from the *Brisbane Queenslander* throws an interesting light on the possibilities of extensive irrigation by means of water from artesian bores. “In the central division of the State there is a large tract of country known as ‘the desert.’ It is of little value for grazing purposes, and, owing to the prevalence of dry seasons, it cannot be utilized in the ordinary way for agriculture. During the last six years various experiments have been carried out at some expense to prove that suitable crops may be grown there by the aid of irrigation. Nature has supplied it with an apparently inexhaustible reservoir of artesian water proved to be suitable for irrigation. The land is easily cultivated, will produce crops in the driest of seasons, and give heavier yields of wheat, oat hay, barley, potatoes, and other vegetables than any other soil we know of in Queensland. The water from the artesian bores is so pure that it deposits no mineral sediment to injure the soil, as is proved by the fact that for six years the same places have been continuously irrigated without any ill-effects. It is admirable soil for growing any kinds of citrus trees and for vines, as is evidenced by the orchard and vineyard of the Alice River settlement, situated some four miles from Barcaldine, on the Central Railway. An artesian bore in that part of the country will give a supply of about 500,000 gallons per diem. This is sufficient to irrigate at least 60 acres. It may irrigate a larger area than this by judicious manipulation. The cost of putting down a bore at the present time is considerably less than it was a few years ago. Half-a-dozen artesian wells in this country would cost now about £300 each. The cost of irrigating from such a supply is only a trifle, as it is applied by gravitation, the water flowing from the bore into main drains made by plough and delver, and thence by furrow through the ground to be irrigated. The few settlers who have been growing crops in this manner have done well. The seed germinates a few days after saturation of the soil, and if sown in June the hay is ready for harvesting in September. Potatoes and all kinds of vegetables grow well. The latter are sent by train to Rockhampton, where there is a good market for this kind of produce. The Alice River settlers have 15,000 cabbages in their gardens. These were selling in Rockhampton last week at 9s. 3d. per dozen. The main advantage in irrigating is that the crop is always safe. The dry season cannot destroy or injure it. The hot, dry climate enables the irrigator to use copious supplies of water, and this in turn produces heavy crops.

NEW BOOKS, etc.

THE CANADIAN MINING INSTITUTE. (Ottawa, August, 1902). *The Journal of the Canadian Mining Institute, 1902, containing the Papers and Proceedings of the Meetings of the Institute.* Edited by the Secretary, B. T. A. BELL. Volume V., 8vo., pp. xv. + 649. This volume contains the transactions of the Canadian Mining Institute during the past year, and the papers given will be found most interesting and useful to mining managers and engineers. The mining industry of Canada grows in importance every year, as the mining districts become more developed. This is due mainly to the work of the various mining schools, in which large numbers of young men have been trained in the study of mining. Many of these are now members of the Canadian Mining Institute, an institution which has greatly contributed to the progress of mining and metallurgy in the Dominion. Mining engineering has received much attention and the methods adopted have proved very successful.

SUTTON AND SONS (Reading, England). *Vegetables and Flowers from Seeds in Tropical, Semi-tropical, and Temperate Climates.* By Sutton and Sons. Illustrated, 8vo., pp. 331. This handsome volume is intended to give information to Europeans, who may have settled in distant lands, as to the growing of vegetables and flowers of their native countries in suitable localities. It is possible to grow most of the productions of temperate climates in every country of the world, given a due amount of care and attention, but some knowledge of local conditions and the exercise of judgment will be necessary to avoid experiments that must inevitably end in disappointment. The suggestions given in this book as to the proper time for sowing seeds in different climates and countries, and the soils best suited for growing the various plants will be of great service to amateur gardeners. The directions are clearly written, and the volume is printed in good style, the beautiful illustrations being artistic and well drawn, especially those of the different sorts of flowers, in which the shades of the petals are most carefully and skilfully depicted.

MR. H. J. MORGAN, of Ottawa, the editor of *Canadian Men and Women of the Time*, has in the press a volume entitled *Types of Canadian Women and of Women Connected with Canada, Past and Present*. This work is described as “a picture gallery, accompanied by a biographical dictionary, of Canadian women, from the earliest times, who have excited interest or claimed attention either by reason of their official position or their more personal titles to distinction.” The work will be published by Mr. William Briggs, of Toronto.

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MONTHLY COMMERCIAL AND INDUSTRIAL SUMMARIES.

GENERAL COMMERCE AND INDUSTRY. UNITED KINGDOM.

Science and Industry.—An important report has just been issued respecting the recent enquiry of a special sub-committee of the Technical Education Board of the London County Council on "The Application of Science to Industry." The committee arrived at the conclusion that "various branches of industry have during the past twenty or thirty years been lost to this country owing to the competition of foreign countries; that in many others our manufacturers have fallen seriously behind their foreign rivals; that London in particular has distinctly suffered; and that these losses are to be attributed in no small degree to the superior scientific education provided in foreign countries."

While some of the witnesses examined attributed the relative backwardness of this country in scientific industries partly to other causes, they were practically all agreed in considering it due, in the main, to the deficiencies of our educational system. It did not appear that the training of the workmen was at fault. It is believed that the opportunities now open to the London workman for obtaining technical education in his trade are actually superior to those enjoyed by the German or American workman. Summing up all the evidence, the committee are convinced that the main causes of our relative failure in the chemical, optical, and electrical industries are the following: (a) The lack of scientific training of the manufacturers themselves, and their consequent inability to recognise the importance of scientific assistance; (b) the defective condition of our secondary education, and the consequent lack of sufficiently-prepared recruits for advanced technological training; (c) the lack of a sufficient supply of young men who have been trained, not only in scientific principles and method, but also in the application of science to particular industrial processes; (d) the lack of any institution providing advanced technological training which is sufficiently equipped and endowed to enable it to give adequate attention to post-graduate or advanced work. There is a consensus of opinion that the highest grade of technical education must be carried on in an institution of university rank during the day. The few hours which can be given in the evening by those who are engaged in business during the day, are insufficient for training in research.

Sir Henry Roscoe voiced a general opinion in declaring that "the most important requirement here, in order to provide the necessary training for leaders of industry, is a perfectly-equipped school for theoretical and applied science, similar to those of Charlottenburg, Zurich, and Munich, with several professors in each faculty, such as chemistry, engineering, etc."

Cotton and the Decimal System.—The following official announcement has been made by the Liverpool Cotton Association:—

On and after October 1 next trading in "spot" and "futures" American cotton in Liverpool will be in hundredth parts of a penny per pound instead of sixty-fourth parts; and on the same date the discount of one and a half per cent. hitherto allowed will be abolished. This important change in terms will result in a lowering of quotations by approximately 4-64d. to 5-64d., or 6-100d. to 7-100d. per pound, being the equivalent of the discount no longer given, the net value thus remaining unaltered. On the same date the weight of the American cotton contract for futures will be altered from 47,200 lb. to 48,000 lb.

COLONIES.

Cape Coal.—It is stated in the Cape Government Railway report that under a contract which has been entered into, with certain reservations, rather more than half the coal used on the Cape railways during the current year will be obtained from mines situated on the banks of the Vaal river at a cost of 10s. per ton at the pit's mouth, while arrangements that have been entered into with coal-mining companies in Cape Colony will enable the department to obtain a very considerable quantity of coal suitable for railway purposes on much more favourable terms than formerly. It is hoped that as the result of the purchase by the Government of the Cape collieries line for the purpose of adding to the area of available Cape colonial coal supply, as well as such extensions of short railway branches as have been provisionally authorised for the same purpose, a larger supply of Cape colonial coal at moderate prices will become available. During the year 1901 the total average price paid for colonial coal was 19s. 2d. per ton of 2,000 lb., and for imported coal 52s. 3-7d. per ton of 2,000 lb. It is considered that a saving of at least £200,000 per annum in the cost of coal at the rate of consumption in 1901 can and should be effected after paying a reasonable price for Cape coal.

Cape Fruit Trade.—The Cape fruit imported into England during the 1902 season, just ended, yielded on the whole very satisfactory results. According to a report drawn up by Mr. G. E. Hudson, of Suffolk House, Laurence Pountney-hill, E.C., the quality and condition of the past season's fruit showed improvement on those of previous years' consignments—grapes perhaps excepted—and the pecuniary outcome has been a far better one for shippers generally. The following are the imports of the 1902 season, as compared with the four previous ones, viz.:—1898, 9,169 boxes; 1899, 10,817 boxes; 1900, 17,336 boxes; 1901, 17,263 boxes; and 1902, 14,998 boxes. Of the last quoted total no less than 5,896 boxes contained grapes, 3,068 plums, 2,512 peaches, and 1,999 nartjes (a kind of orange), the remainder containing pears, apricots, nectarines, apples, quinces, pines, oranges, and lemons. Mr. Hudson maintains that until grapes, for instance, are properly stored in ships' cold chambers, where they can get an abundance of dry as well as cold air, they will never be carried successfully. The 1901 grape season, he says, was a failure, and the 1902 season was not "very much better." If one shipment of grapes arrived in good condition the next was very wet, and it was thus impossible to maintain a paying price. "And yet," Mr. Hudson adds, "there is a big trade to be done in Cape grapes in this country if we can only get them here in as good condition as we used to."

Federated Malay States.—The report on the Federated States of the Malay Peninsula for the past year is highly satisfactory in almost every respect. The revenue was the highest ever obtained. Mining and planting were both prosperous. The production of tin, which is the chief industry of the States, was 46,960 tons, so that, although prices were low, the aggregate value was about 5½ millions sterling, or over 53½ million dollars. The cost of living and of working the mines has so greatly increased of late years, while the exchange value of the dollar has so decreased, that any serious fall in the price of tin would inevitably lead to a number of the mines being obliged to stop. At 60 dollars per picul (133½ lb.), says the report, this would take place; last year the average price was 67½ dollars. The European planters of Liberian coffee were disappointed by the low prices prevailing last year; nevertheless,

in Selangor and Negri Sembilan, the European estates are nearly all in good order, and there is a general improvement in the quality of the coffee. The export last year was over 3,000 tons. The cultivation of rubber is rapidly extending, and the reports as to it are most encouraging. The total trade of the States last year was 102½ million dollars, against 98½ millions in 1900. The imports were nearly 39½, and the exports over 63 million dollars. As to railways, there were open at the end of the year 147 miles in Perak, and 97 miles in Selangor, the net revenue from which was over a million dollars. There has been a great increase in the population on account of the rapid expansion of tin mining, the employment of large numbers of labourers in railways and other public works, and the steady growth of planting and agriculture. Pahang, a large State on the east coast, which was the last to join the Federation, is also progressing, but is in great need of improved communication with the west coast. A line of railway for the purpose is in contemplation.

Lagos Planting Industry.—The following interesting report on the subject of the cocoa and cotton industries at Lagos has recently been forwarded by the Governor of Lagos:—

"Report by the Superintendent of Forests on the Cultivation of Cocoa in the Colony of Lagos (Officer in Charge, Secretariat). A considerable increase in cocoa planting has taken place, and is still continuing. Should the results of the small shipments now going forward prove profitable, there will be a large export of cocoa within a few years as the trees now being planted come into bearing. We have lately started a planters' society in Abeokuta for the discussion of matters of this kind, and also for the spreading of accurate information on planting subjects. I note that the Lagos Chamber of Commerce speaks very confidently as to the future prospects of cocoa. However rosy these may seem, they are not a bit more hopeful than were those of coffee in 1893. It was at about that date that planting began to be taken up in Egba, and a great deal of land has been under coffee, which is now bearing well. Last year, at the instigation of Messrs. Elder, Dempster and Co., we did our utmost to spread the cultivation of cotton, distributing seed all over the country. Farmers have taken it up well, and a large quantity of land is being planted with it this dry season. What we really want now are one, or perhaps two, central factories, with steam power and machines, for turning out the produce in a marketable form at a reasonable price. Cocoa—should no over-planting take place, as happened in the case of coffee—is well adapted in its preparation to the family industry on a native farm. Coffee—there are two points. We have a large quantity now of trees in bearing, and the price, I suppose, cannot be counted on at over 30s. It cannot be picked and cleaned at this price with hand labour, but a central factory, with one of Howe's hullers and steam power, could, I think, do it, and leave a fair margin, so as at least to give a new export, and avoid the waste of all the labour expended in coffee planting. In fact, throughout the cocoa, coffee and cotton planting industries, as well as in connection with the proposed cultivation of agave fibre, the need for the central factory system becomes more and more apparent."

Natal.—MINING PROSPECTS.—In his recently-issued report on the mining industry of Natal for the year 1901, Mr. C. J. Gray, A.R.S.M., Commissioner of Mines, states that mining "has been more successful than in any previous year." The output of coal was, it appears, in excess of any previous output, being 569,200 tons, of a value at the mine of approximately £549,439. The highest annual output previous to the past year was 387,811 tons in 1898. Seventeen collieries produced coal in 1901, against fourteen in 1900. The output of the new producers was, however, only 2,015 tons, or 0.3 per cent. of the total. The Commissioner adds that the output of coal would have been considerably larger but for the difficulty of obtaining transport from the collieries, owing to the demands on the railway for military and other transport, and lack of native labour for underground work. The transport difficulty was the more acute in the earlier portion of the year, and the labour difficulty later. In regard to gold mining the report states that the output was declared at 156.16 oz., equivalent to 135 fine ounces of a value of £531. The amount of rock crushed was approximately 1,444 tons, so the yield was only 2 dwt. fine gold per ton. During the year attention has been given to the possibility of obtaining gold at a profit from the rivers of the colony by means of dredges, but the Commissioner says it is impossible for him to forecast "with any accuracy the possibility of gold-dredging in Natal."

INDIA.

Import and Export Trade.—The official review of the trade of India for the year ending March 31, 1902, shows that both imports and exports largely increased as compared with the previous year. The following are the figures in rupees:—

		1900-01.	1901-02.
Imports.			
Merchandise . . .		76,27,73,853	81,47,08,170
Gold		11,87,13,827	8,29,76,205
Silver		4,59,22,253	11,35,07,591
Total Imports . .		92,74,14,933	101,11,91,966
Exports.			
Foreign Merchandise re-exported . . .		3,20,85,314	3,26,03,218
Indian merchandise .		104,16,04,984	121,20,45,021
Gold		4,30,58,851	3,36,64,783
Silver		3,16,85,700	5,09,60,877
Total Exports . .		114,84,34,849	132,92,73,904

IMPORTS.—It will be seen that the imports of merchandise increased in value by £3,462,000, much of the increase indicating the restoration to the people of purchasing and consuming capacity, and the resumption of industrial operations, after the period of depression had passed away. Cotton goods and yarn increased by about £2,040,000, and there was a marked revival of activity in the imports of machinery and mill work, metals, mineral oils, railway material, coal, chemicals, and dyes. The importations of beet sugar were very large during the year, exceeding substantially the heavy imports of 1897-98, which led to the imposition in 1899 of countervailing duties on bounty-fed sugar. Of the aggregate quantity of sugar imported into India last year quite 54 per cent. was beet sugar, and of this the great mass—bounty-fed—was imported from Austria-Hungary and Germany—141,753 tons out of the 151,517 tons imported, sugar of Austrian origin representing 112,896 tons. The import trade in synthetic indigo was very active, reaching a value of 65,74,638 rupees. It is suggested that it is possible that British dyes may now try the market, "but the Continental manufacturers, represented in the main by the well-known Badische Fabrik, whose operations with synthetic indigo have so rudely interfered with Indian indigo in the European markets, have secured a strong position for their dyes here."

EXPORTS.—The exports of Indian merchandise increased by £11,362,000, the increase being at the rate of 16 per cent. Most of the improvement may be assigned to the agricultural products, which are such dominating factors in the export

trade. The return of a good season, with good harvests, led to a trade greatly in excess of that of the previous year in rice, wheat, oil seeds, cotton and jute. The ability to supply these articles to the consuming markets found those markets ready to take them at profitable prices, and the trade of the year was, on the whole, of advantage for the exporter as well as for the producer.

New Outlets for Tea.—Messrs. Harrisons and Crosfield's report with reference to the Indian and Ceylon tea markets states:—"In the direction of finding new outlets for surplus supplies, an interesting experiment has been in progress amongst the native populations of India for the last twelve months, said to be the outcome of a suggestion of the Viceroy, and assisted by contributions of tea from the principal planters and a grant of money from the Tea Association: namely, the hawking of small packets of Indian tea through the country, containing about ½-oz., which are sold for one pice, or one-twelfth of a penny English. In this manner, the sales for the twelve months have been 330,000 lb.; the demand is rapidly growing, and the promoters are sanguine enough to anticipate a sale of 20,000,000 lb. annually in a few years, which, if realised, would more than take off the present surplus."

FOREIGN COUNTRIES.

Cotton Goods Trade in Cuba.—The United States Minister to Cuba, Mr. H. G. Squiers, reporting under date of August 12, says that American manufacturers have failed either to study or to heed certain requirements which he deems indispensable, if they expect to gain and retain the cotton-goods trade in the new Republic. He says that they rely almost wholly upon the export commission houses of New York which are engaged in the Spanish-American trade, and that, when occasionally they send a direct representative to work up trade, he is almost certain to have no knowledge of Spanish, so that he must transact business through interpreters. He also says that the European houses, with which the Cubans have so long been accustomed to deal, are very liberal in the matter of credits. In spite of this liberality, failures are very rare among the Cuban importers of textile fabrics. He goes further, however, than most foreign officials in laying down very plain requirements, which he insists should be complied with. Among them are "special and careful packing, giving exact and minute details of goods in the invoices or on a separate memorandum attached to invoices. This should specify marks and number of packages and gross and net weights. The net weight of each separate class of goods contained in a single case should be specified; how each is packed, whether without wrapper or with paper wrappers or pasteboard boxes, and the net weight, with and without wrappers and pasteboards; the total number of pieces of each class or quality, the total number of yards, price per yard, width, whether white, crude, printed, or manufactured with dyed yarns; and whether mixed with wool, silk, or linen. On the foregoing data depends the tariff classification; for this reason the statement is essential to the merchant here, as it remarkably facilitates his Customs declarations." He says that the British have by far the largest share of the cotton-goods trade, while Spain and the United States are close rivals, the former surpassing the latter in some important branches, notably in knitted hosiery and underwear. As to the efforts to gain a general trade in other lines, he insists that too much importance cannot be attached to labelling and advertising goods in the Spanish language, this being absolutely essential to their ready sale and popularity.

German Trade with Africa.—The Imperial Statistical Department has published an account of German Trade with Africa during 1901. The export and import trades combined exceed 10,000,000 marks (£500,000) in value only in the case of Egypt and of the British possessions in South and West Africa. The value of the imports from Egypt amounted to 32,100,000 marks (£1,605,000), a considerable decrease, and the exports to 16,500,000 marks (£824,000), a slight increase. The principal imports were raw cotton, cigarettes and onions, the principal exports iron and ironware, textile fabrics, articles of precious metal, clay and porcelain ware, and machines. The import of raw cotton was less than that of the preceding year; the export of iron and ironware has increased. The value of the imports from British South Africa was 21,900,000 marks (£1,095,000), the value of the exports 20,000,000 marks (£1,000,000). Both have increased, the imports by 3,300,000 (£165,000), the exports by 7,500,000 marks (£375,000). The principal articles of import were raw wool and ostrich feathers, and of export, beer in bottle, iron and textile wares, sugar, cement, pianos, and machines. There has been an increase in most articles of export, and in the import of raw wool. The imports from British West Africa show a value of 30,900,000 marks (£1,545,000), while the exports amounted to only 7,600,000 marks (£380,000). Imports have slightly increased and exports slightly decreased. The principal articles imported were palm nuts, palm oil, caoutchouc, and gutta-percha; the exports included perfumery, spirits, and coarse and fine ironware. The import of palm nuts has increased considerably.

LABOUR MARKET.

UNITED KINGDOM.

Wages and Hours of Labour in 1901.—The annual report by the Labour Department of the Board of Trade on changes in rates of wages and hours of labour in the United Kingdom in 1901 records a decline in wages since 1895, thus confirming the forecast made in last year's report. Mr. H. L. Llewellyn Smith, in his introductory letter, mentions that for the first time since 1895 a decline in wages has to be recorded. During the past year about 430,000 workpeople received advances amounting to £41,000 per week, while 493,000 had to submit to decreases amounting to £118,000 per week. The net weekly decrease for 1901 was thus £77,000, against increases of £209,000 in 1900 and £91,000 in 1899. The decline is accounted for "mainly by the fall in miners' wages, the rise in which was the predominant feature of the statistics for the years 1898-1900. The fall in wages in this industry accounted for over 80 per cent. of the total weekly decrease in 1901. A considerable decline also occurred in the metal trades, averaging 4s. 1d. per head, but only 21,121 were affected. In the remaining industries the net result for the year was a slight increase. It is estimated that, taking into account the various dates at which the changes came into operation, the net decrease in the wages bill of 1901 due to changes recorded in this report was about £1,584,000. This compares with a net increase of £6,000,000 in 1900. The best feature recorded in the report is the increased tendency to settle changes by conciliation or arbitration. During 1901 only two per cent. of the workpeople whose wages were changed were engaged in disputes on this account. This percentage is the lowest recorded. In the case of three-fourths of the workpeople, the changes were arranged by conciliation, arbitration, wages board, sliding scales, and similar machinery. This fact is, of course, connected with the prevalence of agencies of this kind in the coal and iron trades which were those most affected by the wages changes in 1901. During the first half of 1902 the fall in wages in the mining industry has continued and become even more wide-spread; the total number of miners affected by the reductions in this period have been no less than

625,000. On the other hand, the fall in wages in the metal trades has been much less noticeable than in 1901, and no other groups of trades show a decline. As regards changes of wages the following table shows for each group of trades (other than agricultural labourers, seamen, and railway servants), the average net increase or decrease per week in the wages of those directly affected:—

Groups of Trades.	Number of Workpeople affected.	Net amount of Increase (+) or Decrease (—) per week in Wages.	
		Total.	Average per head of those affected.
Building Trades	39,687	+ 1,943	+ 0 11 ³ / ₄
Mining and Quarrying	725,750	— 62,635	— 1 8 ³ / ₄
Metal, Engineering, and Shipbuilding	103,216	— 21,121	— 4 1
Textile Trades	3,098	+ 290	+ 1 10 ¹ / ₂
Clothing Trades	5,409	+ 691	+ 2 6 ³ / ₄
Miscellaneous Trades	27,338	+ 1,656	+ 1 2 ¹ / ₂
Employees of Public Authorities	27,628	+ 1,833	+ 1 4
Total	932,126	— 77,343	— 1 8

As regards the hours of labour, with the exception of the year 1895 the reductions were less in 1901 than in any other year for which statistics have been collected. During 1901 only 29,276 people were affected by the changes in hours of labour, of which total 586 had their working hours lengthened and 28,690 had them shortened. The net result was a reduction of 58,728 hours per week, or an average of two per head of those affected. It need hardly be pointed out that 58,728 hours is quite an infinitesimal fraction of the total working hours of the industrial population. In fact, the total reductions in hours reported during the nine years, aggregating slightly less than 1,300,000 hours, represent when spread over the total industrial population, an average reduction of less than ten minutes in the weekly working hours. The principal changes in 1901 were in the printing trade. In Mr. Llewellyn Smith's report, "some preliminary figures for the first half of 1902 are also included, and it is stated that during the first six months of 1902 the main features of the changes in wages have been generally similar to those of the previous year. During this period about 681,000 workpeople were affected by the changes in rates of wages reported, viz., 32,000 by increases and 649,000 by decreases. Of the latter 625,000 were employed in mining and quarrying and 23,000 in the metal trades. These are the same groups of industries in which the decline took place in 1901, but it will be noticed that while the fall of miners' wages has been more widespread in 1902 than in 1901, that of wages in the metal trades has been much more restricted. So far as reported, 12,617 workpeople have had their weekly hours of labour changed, the net result of all changes being an average decrease of about 1½ hours per week."

Strikes and Lock-Outs in 1901.—Complete statistics have now been issued by the Labour Department of the Board of Trade regarding strikes and lock-outs in 1901. Mr. Llewellyn Smith says that the disputes of 1901 were not remarkable either for number or magnitude, and they included no stoppage of sufficient importance to overshadow all the others, as in some recent years. The aggregate duration of all the disputes in progress during the year, though below the averages, was somewhat greater than in 1900, chiefly owing to an increase of stoppages in the mining industry, which, though all of a purely local description, were in some cases very prolonged. The 642 fresh disputes recorded in 1901 involved nearly 180,000 workpeople, or about 2 per cent. of the industrial population of the United Kingdom. The aggregate duration of disputes (new and old) during the year was about 4,000,000 working days, or about 20 days per head of those affected. The loss of time during the year, if spread over the whole industrial population, amounted to about half-a-day per head. On the whole, the results of the disputes were more in favour of the employers than in the previous year. The number of actual stoppages settled by arbitration or mediation was only forty-one, but these included some of the most widespread and prolonged disputes of the year.

The following table gives statistics for the five years, 1897–1901, of the number of disputes beginning in each year, and the total number of workpeople involved, distinguishing those directly on strike or locked-out from those thrown out of work as a result of trade disputes, but not themselves on strikes or locked-out:—

Year.	No. of Disputes beginning in each Year.	Number of Workpeople affected by Disputes beginning in each Year.			Aggregate Duration in Working Days of all Disputes in each Year.
		Directly.	Indirectly.	Total.	
1897	864	167,453	62,814	230,267	10,345,523
1898	711	200,769	53,138	253,907	15,289,478
1899	719	138,058	42,159	180,217	2,516,416
1900	648	135,145	53,393	188,538	3,152,694
1901	642	111,437	68,109	179,546	4,142,287

In 1901, the following were the total numbers of workpeople affected by disputes in various trades:—Building, 9,797; mining and quarrying, 112,981; metal, engineering and shipbuilding, 22,489; textile, 16,609; clothing, 4,135; transport, 2,682; miscellaneous, 10,489; employees of public authorities, 364.

The methods by which the disputes of the year were settled were as follows:—Arbitration, 23, affecting 8,349 workers; conciliation and mediation, 18, affecting 8,465 workers; direct arrangement or negotiation, 456, affecting 143,470 workers; return to work on employers' terms without negotiation, 45, affecting 9,362 workers; replacement of workpeople, 89, affecting 6,415 workers; closing of works, 5, affecting 1,288 workers; indefinite or unsettled, 6, affecting 2,197 workers. It will be seen that the great bulk of the disputes were settled by direct negotiation between the parties concerned or their representatives—71 per cent. of the total disputes in 1901, affecting 80 per cent. of all persons involved in the disputes, being so arranged.

FOREIGN COUNTRIES.

Trade Unions in Germany.—The following translation from a recent publication of the Imperial Commission throws much light upon the condition of trade unions and kindred associations in Germany:—Germany has 145 Chambers of Commerce and Trade and 10 of Agriculture. Around these are grouped the People's Industrial Council, the German Agricultural Council and the Land-Economy Colleges. The interests of the traffic are represented by the Home Railways

Council. The learned professions are regulated by Councils of doctors and lawyers. Besides these, there are various independent associations to protect the interests of manufactures, trade and traffic, and other unions to represent special classes and callings, namely, the Union of German Smelters, the great associations of architects and engineers, the German Fishery Union, the Inland Shipping Union, the Householders' and Tenants' Unions, all of which have been established throughout the land for all the more important occupations and branches of industry. It is not alone the independent workers who have thus banded themselves together for the promotion of general as well as special industrial interests, but the movement has spread, and includes unions and officials, commercial unions, and associations of workmen of every description. It is chiefly for the promotion of industrial objects that the *cartel*, or union of masters, has been formed; then there are associated enterprises of various groups and classes; and, finally, the co-operative societies of the working classes. German co-operative societies and associations can look back upon a half century of successful activity. At present, the self-aided trades and industrial co-operative societies number altogether upwards of 17,000 local societies, of which about 9,000 are agricultural, and include more than a million peasants. Fourteen thousand co-operative societies are comprised in 29 unions. The most prominent of these are the General Union of Self-aided Trades and Industrial Associations, which has its head-quarters at Charlottenburg, and consists of 32 affiliated unions and 1,371 associations, the General Union of Agricultural associations at Offenbach, with 28 affiliated unions and 6,505 associations; and the General Agency Union at Neuweid, with 3,228 associations. Besides these three gigantic societies, there are smaller ones of some importance. Of industrial unions, there were 59 in 1898, with almost 500,000 members. So far, working women have taken but little interest in the industrial movement. The largest list of members belonging to industrial unions is among the metal workers (75,000), the wood-workers (60,000), the textile workers (27,000), and the miners (28,000). The most perfect of these work unions is that of the book printers, consisting of 24,000 members. Of the others, the carpenters number about 20,000, while the persons employed in the tobacco trade and the workers in the manufactories, shoemakers, harbour and stone labourers, furnish severally from 10,000 to 15,000 members. The second group, the so-called *Hirsch-Ducker* trade unions, includes at the present day 86,500 members in 1,700 local unions. Of these, 34,000 belong to unions of engineers and metal-workers and 16,500 to those of handicraftsmen and workers in manufactories. For the protection of special interests, as opposed to the workmen, there are unions for the employers of labour. In the foremost rank is the Hamburg league, with 17 large associations, which comprises the most varied industries, and extends to a number of neighbouring places. The next in importance is the Berlin League of the Employers of Labour. In addition to these general leagues, there are others of special branches of industry, which are sometimes organised locally and often cover large portions of the country. Three are for mining and smelting concerns, 11 for metal manufacturers, 4 for brewers, 4 for the textile trades, 9 local and 1 central league for the building trade, 2 for the hat trade, and 1 for the manufacture of tapestry, besides 3 leagues of masters in the manufacture of wood. Other leagues, representing especially the industrial side of professional interests, also exist in the liberal and learned professions.

EMIGRATION AND IMMIGRATION.

* * *The Imperial Institute acts in concert with the Emigrants' Information Office (which is under the direction of the Colonial Office), of 31, Broadway, Westminster, S.W.; and also with the British Women's Emigration Association, now temporarily carrying on its work in rooms at the Institute. The Handbooks and Quarterly Circulars issued by the Emigrants' Information Office may be obtained at the Commercial Intelligence Office. Special information and practical advice respecting Canada and Cape Colony will also be furnished by the Curators of these Sections.*

UNITED KINGDOM.

The British Women's Emigration Association.—The hon. secretary reports 2,257 applications in the month ended September 21. Over 2,000 of these related to South Africa, and the secretaries for that department of the work at the office are overwhelmed with letters from poor girls who have read in various inferior papers most inaccurate accounts of the wages to be obtained by servants in South Africa, £8 a month being quoted as if it were the minimum. It is no small part of the business of the Association to give accurate information to all enquirers, but it is not easy to alter their pre-conceived notions. The Government is sending out to Africa the wives and families of men remaining there in large numbers by the transports, but now that most of the troops returning to England have already left Africa, these ships will no longer be available. Seventy-three berths were granted for women recommended by the South African Committee of the British Women's Emigration Association in s.s. *Plassey*, which sailed on September 20 from Southampton. These persons were all going out either to definite employment already arranged for them, or to join relations who were prepared to receive them. Altogether 111 have been despatched to the colonies in the last month, to Canada 17, Australia 4, South Africa 90.

There will be a small extra party made up on October 9 for those who cannot wait for the last party of the season to Canada on October 30. Some few young women will be sent to South Africa in s.s. *Galeka* October 18. The Australian and New Zealand liners which usually touch at the Cape are too full of long-voyage passengers returning to their homes to be available at present for travellers to South Africa. New lines of steamers for South Africa from Liverpool, Canada, New Zealand and Australia, are projected, and the enormous prices for food, building materials, etc., will come down when the importations increase. In this hurrying generation people are apt to forget that time is necessary, that things cannot change all at once from a state of War to a state of Peace.

Now that the Hostel for Travellers is opened in London we quote the rules and terms on which people can be received, as follows:—The Wortley Hostel, 22, Upper Westbourne-terrace, Paddington, W., for the accommodation of the travellers of the British Women's Emigration Association and the societies working with it. Board and lodging for one night, 3s. 6d. and 5s. Other persons received as temporary boarders; terms, bed one night, 1s. to 3s. 6d.; per week, 3s. 6d. to 10s. Full board and lodging per week 15s. to 25s. Application to be made to the matron, Mrs. Church. Three days' notice to be given. References required. Nearest stations, Praed-street, Paddington, and Royal Oak. Omnibuses Royal Oak. It is intended to train two or three girls at a time for domestic service, either with a view to their becoming qualified for emigration, or for situations in England. Although young women are not scarce, servants are, and England cannot be expected to be able to meet the demand for them from the colonies without seriously

inconveniencing her own domestic affairs. Girls who wish to emigrate are valued in the colonies in proportion to their usefulness in household matters, and the first step towards a successful career in the new country is to learn some branch of practical domestic work. Any who wish to go to Canada next spring can spend the intervening months in both learning and earning with a view to emigration.

COLONIES.

The last report of the Government Labour Bureau in Western Australia shows as follows:—There is an ample supply of men in the building and other trades at Fremantle, Coolgardie, Albany, and other towns, and on the goldfields many are out of work, but there is a demand for them in one or two small places, as Menzies and Northam; the supply of miners is quite sufficient except at Donnybrook (gold) and Greenbushes (tin); there is a good demand for agricultural labourers in many districts; the supply of general labourers is sufficient, except at Northam, Beverley, and one or two other places; there is a good demand for female servants.

In Tasmania there is a moderate demand for skilled farm hands and female servants, and on the West Coast for miners.

In New Zealand there is a good opening for farmers with capital, farm labourers, miners, female servants, and a limited number of mechanics, but not for general labourers; passages at reduced rates are given to persons possessing fixed incomes or a little capital.

In Cape Colony there is a good demand for female servants, but they should not go by themselves; there is no demand for more mechanics or miners, nor for general or farm labourers, who are mainly coloured men. Persons going to Cape Colony do not now require permits.

No one is now allowed to land in Natal without a permit. This must be applied for personally at the Permit Office, 47, Victoria-street, London, S.W. The applicant must possess £100, or prove that he is in a position to maintain himself in South Africa. There is now no special demand for more artisans, a large number of carpenters and others in the building trades having lately arrived, but skilled men can find work. The following persons are wanted for the Government railways; engagements are for three years; candidates must apply to the Agent-General for Natal, 26, Victoria-street, London, S.W., enclosing particulars as to age, height, whether married or single, with medical certificates and testimonials; free passages are provided, and half-pay during the voyage:—Good plate-layers between 25 and 40 years of age, with five years' experience, wages £11 to £15 a month; carriage and waggon examiners, having five years' experience, wages 9s. a day. There is a good demand for female servants, but they should not go alone.

Permits (see above) are required by those going to the Transvaal and the Orange River Colony. These will not be valid unless endorsed by the representatives of those colonies at the port of disembarkation. There is a fair demand on the Rand for really first-class mechanics in the building trades, at an average wage of a little more than £1 a day, but the market is limited, and emigrants must remember that the cost of living is at least double that in England, rent being especially high. There is no demand for ordinary labourers, of whom there is a large local supply. An experiment is being tried by some of the mines in employing white men for general labour at 5s. a day and food, which makes up about 8s. 10d. a day. There is a demand for female servants at £5 a month, but they should not go alone. The Women's Immigration Department in Johannesburg has lately arranged a scheme, subsidised by the local Government, by which domestic servants in England may have passages advanced to them on condition of their repaying £12 out of their wages; application should be made to the South African Expansion Committee, Imperial Institute, London, S.W. The Transvaal and Orange River Colony Enquiry Office has been opened at Cape Town for the purpose of providing information on those colonies, and as to openings for obtaining land.—*Emigrants' Information Office Report.*

FOREIGN COUNTRIES.

Emigration from Hungary.—The Hungarian Government is preparing to adopt stringent measures for regulating and restricting emigration. Dr. Selley, Ministerial Councillor, disclosed the outlines of a Bill shortly to be introduced in the Hungarian Diet. The most important section of the proposed law categorically forbids emigration before State and family obligations have been fulfilled. This presumably refers primarily to military service. The Bill further provides for the strict control of emigration agencies and transportation companies, and prescribes severe punishment for persons attempting to induce emigration by means of misleading statements or advertisements.

CUSTOMS TARIFFS.

UNITED KINGDOM.

Importation of Animals from Alderney Permitted.—A recently issued General Order of the Commissioners of Customs (No. 67 of 1902) contains the text of an Order, entitled the "Alderney (Animals) Order of 1902," which was issued by the Board of Agriculture on the 1st August, and came into force on the 8th August.

The effect of this Order, read in conjunction with the "Jersey (Animals) Order of 1902," is to permit, under certain conditions, the landing of animals in Great Britain from Jersey and from Alderney, but not from the other Channel islands. The conditions are stated in the "Channel Islands Animals Order of 1896," as amended by this Order, and by the corresponding Order for Jersey.

Tariff Alteration.—With reference to the duties leviable on composite sugar goods imported into this country, it should be noted that the Commissioners of Customs have recently issued a General Order (No. 72 of 1902) directing that on and after the first ult., fruit, candied and bottled (other than fruit liable to duty as such), preserved in thick syrup, is dutiable at the rate of 2s. 6d. instead of 3s. per cwt. The necessary adjustment is to be made in the accounts of any importations entered since the 1st ult. inclusive.

COLONIES.

Australian Commonwealth.—BY-LAW FOR ADMITTING LINSEED FOR THE MANUFACTURE OF LINSEED OIL FREE OF IMPORT DUTY.—The *Official Gazette* of the Commonwealth of Australia for 11th July, 1902, contains a Customs By-law, which provides that linseed for the manufacture of linseed oil shall be admitted into the States of the Australian Commonwealth free of import duty. The By-law further provides that the Collector of Customs is to be first satisfied that such linseed is intended to be forthwith used for the manufacture of linseed oil, and security is also to be furnished by the importer that the linseed shall be so used, and within six months of the date of importation proof shall be given to the satisfaction of the Collector that the linseed has been so used by the importer.

Bermuda.—TARIFF AMENDMENTS.—The Board of Trade have received through the Colonial Office, a copy of the Supply and Appropriation Act, 1902-3 (No. 7 of 1902), which provides for imposition of duties on goods imported into Bermuda during the year ended 30th June, 1903.

The alterations in the tariff provided for by the above Act are the reduction of the duty on bicycles (with wheels of not less than 18 ins. in diameter) from 10s. to 5s. each, and the inclusion in the free list of articles imported for the use of the Imperial Government, the Governor, Naval Commander-in-Chief, and officers in H.M. Service, and also prizes imported for competition at the annual Army and Navy Rifle Meeting.

The import duties on all other articles remain as before.

Malta.—ALLOWANCE TO BE MADE FOR WASTE ON BEER IMPORTED.—Proclamation No. XX., dated 28th October, 1901, states that, whereas it has been the custom in Malta, in order not to submit importers of beer to the loss connected with the gauging thereof, and at the same time not to charge duty except on the quantity of liquid contained in each cask, after making a just allowance for deficiency, to allow seven and-a-half gallons in every 36 gallons of beer for deficiency in calculating the duty payable thereon. The Proclamation further recites that His Excellency the Governor considers that the ancient custom of making an allowance for the deficiency, irrespective of waste, in calculating the duty on beer, should continue, but that the percentage of such deficiency, including waste, should be reduced from seven and-a-half gallons to four gallons on every 36 gallons.

It is ordered, therefore, that the Collector of Customs shall levy the duty on every hogshead, English barrel, kilderkin, or firkin, as if the hogshead contained 48 gallons, the English barrel contained 32 gallons, the kilderkin contained 16 gallons, and the firkin contained eight gallons, unless the importer prefers to have the actual quantity of beer gauged, in which case the beer shall be gauged and duty charged on the actual quantity imported, and an allowance shall be made only for waste liquid at the rate of 5 per cent.

Newfoundland.—IMPORT DUTIES ON FOREIGN-BUILT VESSELS AND ROUGH UNDRESSED LEATHER, AND DRAWBACK ON BISCUIT IMPORTED.—The Board of Trade have received copies of the undermentioned Acts respecting import duties levied in the Colony of Newfoundland:—

Act XIII. of 1902, under which a duty of 5 per cent. *ad val.* is levied on the fair market value of the hulls, rigging, boilers, steam engines, and other machinery, and all appurtenances of ships and other vessels built in any foreign country, whether steam or sailing vessels, on application for registry in Newfoundland. It is provided that this shall not apply to ships and other vessels built in any foreign country which shall be continuously employed in connection with the trade or fisheries of the colony.

Act XXVI. of 1902 alters the duty on rough, undressed leather, when imported by tanners for further dressing, from 10 per cent. *ad val.* to 3 cents per lb.

The Act also amends Section 8 of the Revenue Act, 1901, by substituting the word ten in lieu of the word one hundred in the last line of the Section. It is provided by the above-mentioned Section that a drawback of 17 cents per cwt. be allowed on the exportation of biscuit—which has been manufactured in the colony from duty-paid imported flour. The drawback is now allowed when not less than ten bags are exported at any one time, instead of only when not less than 100 bags are exported at any one time, as previously provided by the section.

FOREIGN COUNTRIES.

France.—IMPORTS OF COFFEE AND BANANAS FROM FRENCH GUINEA.—A French Customs Circular of the 25th July last notifies that the quantities of coffee and bananas which may be imported into France from French Guinea under the conditions of Art. 3 of the Law of January 11, 1892, between the 1st July, 1902, and the 30th June 1903, have been fixed as follows:—

Coffee	25,000 kilograms.
Bananas	250,000 "

In virtue of Art. 3 of the law referred to above, it is provided that certain quantities, to be fixed annually, of bananas may be imported into France from French Guinea duty free, and that certain quantities of coffee may be similarly imported with a rebate of 78 francs per 100 kilograms, from the minimum tariff rate.

PEPPER FROM FRENCH INDO-CHINA.—It is provided by a French Law of the 12th July last, that the quantity of pepper which may be imported into France from French Indo-China at half-rates of import duty is to be fixed annually by Presidential Decree.

A recent French Customs Circular contains the text of a Decree, dated 4th August, issued under the above Law, fixing the quantity of pepper which may be imported during 1902, at the reduced rate, as follows:—

From Cochinchina	1,000 tons.
" Cambodia	2,100 "

These figures do not include stocks warehoused and admitted to privileged conditions on the 31st March last.

France (New Caledonia).—AGRICULTURAL IMPLEMENTS EXEMPT FROM DUTY.—According to a recent French Customs Circular, the following agricultural machines and implements are, in accordance with a Presidential Decree of the 12th July last, exempt from duty on importation into New Caledonia:—

Hoes of all kinds, horse shovels, horse scrapers, rakes, incubators, churns, milk-skimmers, milk-sterilisers, machines for working up butter, cheese machines and presses, milk-curdling machines, forage presses, crushers, sifters, straw elevators, winnowers, oilcake-crushers, root-cutters, manure distributors, twig-cutters, turnip-cutters, maize-cutters.

Italy.—"TEMPORARY ADMISSION" OF CERTAIN ARTICLES.—The Italian *Bollettino Ufficiale del Ministero d'Agricoltura Industria e Commercio*, for the 20th August, contains the text of a Royal Decree, dated the 3rd July, 1902, extending "temporary admission" conditions to galvanized iron rods intended for the manufacture of insulated electric cells, and to tin plates intended for the manufacture of boxes, chests, etc., for export.

A copy of the Decree and of the Regulations under which temporary admission is accorded may be seen on application at the Commercial Intelligence Branch of the Board of Trade, 50, Parliament-street, S.W., any day between the hours of 10 a.m. and 5 p.m.

Mexico.—REGULATIONS FOR ALLOWANCE OF DRAWBACK ON COTTON GOODS.—The Board of Trade are in receipt of a copy of the Mexican *Diario Oficial* for the 4th August, which contains the text of the Regulations, issued under a Law of the 6th June last, according an allowance of drawback on the exportation from Mexico of textiles of domestic manufacture.

A copy of the *Diario* containing the Regulations in question may be seen on application at the Commercial Intelligence Branch of the Board of Trade.

Netherlands.—EXEMPTION FROM DUTY OF VINEGAR AND ACETIC ACID FOR CERTAIN PURPOSES.—The Board of Trade are in receipt of a translation of a Dutch Royal Decree

dated the 6th Aug., granting freedom from taxation for vinegar and acetic acid for use in the preparation of wires for electric glow-lamps.

Russia.—TEMPORARY FREE IMPORTATION OF APPLIANCES FOR DESTROYING INSECTS, ETC., INJURIOUS TO AGRICULTURE.—The Board of Trade are in receipt of the following list of implements and appliances necessary for the destruction of insects, etc., injurious to agriculture, which may be imported into Russia free of duty up to the 18th/31st December, 1903. The free importation of these articles will be allowed on the presentation to the Customs Authorities, in each separate case, of a certificate from the Department of Agriculture to the effect that they are destined for the above-mentioned purpose:—

1. Implements of various systems for spraying plants and trees with liquid remedies against destructive insects, etc.:—
 - (a) Ordinary implements for spraying (without spray-nozzles, sprayers, and squirts).
 - (b) Spray pumps, hand knapsack and horse, "Vermorel's," "Platt's," and other systems.
2. Implements of all systems for sprinkling the soil with liquid remedies, "Vermorel's," "Shandon's," and other injectors.
3. Implements of various systems for covering plants and trees with powder remedies:—
 - (a) Bellows, ordinary and double action.
 - (b) Powder distributors, "Torpili," "Vermorel's," "Platt's," and others.
4. Boilers of various systems for destroying insects, etc., by means of boiling water.
5. Implements and appliances for coating plants, trees, etc., with liquid remedies.
6. Spare parts and appurtenances for the above-named implements (sections 1 to 5).
7. Metallic gloves.
8. Lamps and torches for destroying insects, etc., by means of the flame.
9. Lamps and lanterns for catching destructive moths by means of the light.
10. Traps, etc., for catching destructive animals and birds.
11. Nets, bag-shaped and others, for catching insects.
12. Artificial nests for insectivorous birds.
13. Bags for the preservation of bunches of vines from destructive insects, etc.

TEMPORARY INCREASE OF IMPORT DUTY ON TEA IMPORTED BY LAND.—The Board of Trade are also in receipt of a translation (in French) of an Imperial Ukaz published in the Russian *Official Messenger* of the 19th Aug., by which the import duty on tea (black, flower, green, and yellow) imported by the territories of Semiretchensk, the Steppes, Irkutsk, and the Amur is temporarily raised by 3 roubles per pound, *i.e.*, to 25 roubles 50 copecks per pound.

*NOTE.—Pound = 36 lb. avoird. Rouble (100 copecks) = 2s. 1½d.

LIST OF DUTY-FREE APPLIANCES FOR DESTROYING VERMIN.—With reference to the temporary free importation of appliances for destroying vermin, the Board of Trade are in receipt of a list of these exempted appliances. The list (in the original Russian) may be seen on application at the Commercial Intelligence Branch of the Board of Trade.

Russia (Finland).—TARIFF ALTERATIONS.—The Board of Trade have received information to the effect that the Board of Customs for Finland have decreed the following alterations in the Finnish Customs Tariff:—

Fire-extinguishing apparatus, consisting of a thin brass socket containing chloride of ammonium and alum, is to be dutiable at the rate of 14 mks. 70 p. per 100 kilograms (6s. per cwt.).

Furniture springs, consisting of cut hardened and coated wires provided with iron hooks for fastening them, are to be dutiable at the rate of 20 mks. 60 p. per 100 kilograms (8s. 4½d. per cwt.).

United States of America.—CUSTOMS DECISIONS.—The following is the substance of some Decisions affecting the Customs Tariff of the United States, which have recently been issued by the Treasury Department at Washington for the guidance of United States Customs Officers and others:—

Spun silk on ceps is dutiable according to value and weight under para. 385 of the Tariff. In determining the value per pound of such merchandise, the value of each cep of silk (including the value of the cep itself) is to be divided by the weight of the silk alone without the cep.

Holy water from Lourdes is not a mineral water within the meaning of the Tariff Act, but is free of duty under para. 614 of the Tariff as a crude mineral not specially provided for.

FREE ENTRY OF RE-IMPORTED FOREIGN GOODS.—According to a recent Circular of the United States Treasury Department, articles of foreign origin or manufacture upon which duty has been paid upon their first importation into the United States may, under certain conditions, be exported therefrom, and thereafter be re-imported free of duty, if not advanced in value or improved in condition abroad. Each article should be presented for registration before it is exported, and satisfactory evidence furnished that the duty was properly paid on the first importation. A certificate will thereupon be issued to the owner entitling an article to free re-importation.

TRANSPORT AND FREIGHTS.

The Freight Market.—Outward rates have declined in most directions and recent fixtures have been on the basis of Alexandria, 5s. 3d.; Port Said, 5s.; Venice, 5s. 6d.; Las Palmas, 5s. 9d.; Plate, 10s. 6d. to 11s.; Rio, 11s. 9d.; Colombo, 13s. 9d. to 14s.; South Africa, 17s. American markets are weak, owing to the large amount of tonnage available. **Australia.**—Chartering business is practically at a standstill. Wool rates down to a farthing, with no demand for tonnage. Some good rains have fallen recently which make the prospects more hopeful. **Black Sea** market is dull, and recent berth fixtures have been on the basis of 10s. 6d. to 11s., Nicolaief and Odessa. **Eastern** markets weak, with the exception of Calcutta, which has taken several boats at 19s. 6d. to 20s. for Jute. **River Plate** market steady at about 17s. to 17s. 6d., San Lorenzo limit.—WEDDEL, TURNER & Co., September 27th, 1902.

COLONIES.

Canada.—NAVIGATION OF THE ST. LAWRENCE.—Messrs. Elder, Dempster and Co., in a letter to the *Times*, dated September 4, state that, with a view to improving the aids for navigation in the St. Lawrence, they sought an interview with Sir William Mulock, and he advised them to write to the Hon. J. Sutherland, Dominion Minister of Marine. The following is a copy of the letter which was sent through Sir A. L. Jones, and also a list of the most desirable improvements:—

"While your colleagues are across here we thought it was a good opportunity to take up the question as to the possibility of improvements to the river St. Lawrence, with a view to the

benefit of the public and ourselves, as we are large underwriters on our ships and cargo. We have had an interview with Sir William Mulock, and he informed us that we had better put all the documents before you. I therefore beg to hand you copies of letters from our lighthouse department in Liverpool, together with charts and suggestions by some of our captains. We think, ourselves, the suggestions made are all in the right direction, but if you will wire to our Montreal house they will send you a couple of our most experienced captains to confer with you as to the possibility of making improvements all round. We feel sure that all the Ministers are equally as anxious as ourselves to make the St. Lawrence route as popular as any other to the mainland. At present we are handicapped; the underwriters say we are in more risky navigation than the northern ports of the United States; but it is a fact, nevertheless, that we have completed during the last three years eighty voyages from Canada without a mishap. We are, therefore, indignant that our ships should be charged such high rates compared with those of steamship lines to American ports. It depends upon ourselves to convince the underwriters that they are wrong. It will do no harm in trying to accomplish this to recognise in any way the deficiencies that may exist in such things as fog signals, buoys, etc. Then, can the draught of water be made a little deeper and the turnings less difficult? If there is anything we can do on this side—we are so interested—we beg of you to command our assistance."

Some of Messrs. Elder, Dempster & Co.'s captains suggest the following improvements in the St. Lawrence, some of the captains having been in the St. Lawrence service for over twenty years: *Rich Point.*—Should have a fog signal and the light improved. *Flower Ledges.*—Should have a powerful fog-horn. *Health Point.*—Interval, at present fifteen minutes, should not be greater than every two minutes (fog signal). Some captains suggest a lightship. *South Point.*—Fog signal, at present a whistle, should be something more powerful. *Fame Point.*—Should have a powerful fog signal. *Father Point.*—Fog signal requires improving. *Cock Point.*—Should have a gas and bell buoy. *Cape Norman.*—Fog signal at present not nearly powerful enough. *Bird Rock.*—Fog signals, at present every fifteen minutes, should be less. *Sambro Fog Signal.*—Should be improved, and the interval between the sounding of it should be lessened. *Cape Ray.*—Whistle not nearly powerful enough. *Halifax Harbour Buoys.*—Not nearly large enough; want considerably improving. *Cape Whittle.*—Should have a light. *St. Peter's Bay.*—Should have a light and foghorn. *Little Macattine.*—Should have a light and foghorn. *Mantane.*—Should have a fog signal. *Little Metis.*—Should have a fog signal. All the captains urge that there should be a chart of the Belle Isle Straits taking in sixty miles round Belle Isle. At present, when in the vicinity of Belle Isle, they have to consult three charts of a different scale.

The Gold Coast Railway.—Mr. R. Knights, the chief of the Gold Coast Railway, left Liverpool for Sekondi early in September, taking with him several engineers and others for service in the construction of the line. Mr. Knights said the line had now been laid 48 miles beyond Tarkwa, and traffic could be taken to that point. This meant that 86 miles had been constructed from the coast port of Sekondi. A survey had been made for a branch line to Princissu, where several gold mines are being developed. This was an important deviation from the main line. Over 16,000 natives are now employed on the line. In the wet season as much as four miles of the line were being laid per month, while between six and seven miles per month were constructed in the dry season. The line up to Obonassi would be completed by the end of this year and to Kumasi by the end of next year. A number of carriages for passengers were already on the coast, and others would be going out in a few months' time. Mr. Knights considered that very good progress was being made with the line, which had now reached Dunkwa, and it was from this point that the survey of the branch line had been made.

Singapore and Australia.—PROBABLE EXTENSION.—The mail service recently inaugurated by the Netherlands India Company between Singapore, the Dutch East Indies, and Australia, will probably be extended to Sydney in the near future.

Transcontinental Railway in Australia.—A recent report of the United States Consul-General at Melbourne contains the announcement of a projected trans-continental railway in Australia. This has been made by means of a letter from Mr. J. J. Rendle, secretary of the North Australian League, Melbourne. It is proposed to build a railway from Adelaide, South Australia, to Port Darwin, North Australia. The special object for making the announcement in this way was the desire to call the attention of capitalists and plant builders in the United States to it. Some details of the scheme are given, of which the following outline is taken from the Consul-General's report. The South Australian Government, Mr. Rendle says, will introduce a measure in Parliament at an early date, offering capitalists facilities to build this line. He encloses maps and circulars descriptive of the route. The circulars set forth the advantages possessed by Northern Australia for stock raising. The drought in South Australia and in the *Hinterland* of New South Wales and Queensland has directed attention to the need of pastoral railways to carry fodder and transport the stock to meat works or new pastures. The Government of New South Wales, to assist pastoralists, has declared its intention of extending a line north-westerly from Bourke to the Queensland border, which will become a stage in the transcontinental line. It is the policy of the Queensland Government to bisect the great lateral trunk lines with a north and south line from the border to Camooweal, which will form another stage. The country offers no engineering obstacles. The length of the entire line from Adelaide to Port Darwin will be 1,896 miles, and the journey from London, *via* the Siberian Railway to Port Arthur and thence by steamer to Port Darwin can be made, it is estimated, in 17 days.

FOREIGN COUNTRIES.

Austrian-Lloyd African Service.—It is believed that the Austrian Lloyd will carry out, at the beginning of October and the end of December, a second and third voyage to South-East Africa, as far as Durban. It will depend upon the result of these trial voyages to what extent a regular service with South Africa will be created from the beginning of next year. If necessity should arise a connection between Aden and India would be made.

Belgium.—BRUGES AS A SEAPORT.—The vast works having for their object the transformation of Bruges into a seaport are now nearly completed. The interior port and the maritime canal are already finished, and there but remains the completion of the necessary sheds, railroad connection, and so forth. The portion of this vast undertaking which has been, and is, causing the most trouble is the building of the jetty. The task was greatly retarded by the hurricane in 1901, which put everything back a full year or more, but, even despite this, the jetty will be ready in 1903. Navigation will be opened in the port at once, and then the large coal-laden Rhine steamers will be able to pass up on their way to the huge new Zee Brugge Coke Factory, which begins working on the 1st of October, and will be able to turn out annually 200,000 tons of coke, most of which will be exported to Germany. It is believed that this

new port of Bruges will probably seriously affect the importance of Antwerp. Indeed, it is even rumoured that the Great Eastern Railway Company will be able thereby to shorten its services to the Continent by several hours.

Hamburg—Alexandria.—NEW SERVICE.—It is reported that the German Levant line will establish a fortnightly direct service from Alexandria to Hamburg at the beginning of the next cotton season in October.

Russia.—BOUNTIES FOR SHIPBUILDING.—The United States Commercial Agent at Vladivostok, in a late report to his Government, gives the particulars of a scheme for the payment of bounties for shipbuilding in Russia. From this it appears that the Council of Mercantile Marine Affairs has had under discussion measures to develop Russian shipbuilding. It is proposed to issue loans or bounties to shipowners to induce them to build ships at home rather than have them built abroad, and to stimulate the purchase of Russian ships built of Russian material. This will be accomplished by a mortgage on the completed vessels at 50 per cent. of the actual cost, without interest, for a period not exceeding 20 years, in equal yearly payments. The cost is ascertained by estimating the expense of building ships in Russia according to certain regulations. The amount of the bounty depends upon the difference between the cost of building ships in Russia and abroad. The loans are issued to sea-going steamships under the following conditions:—(a) Plans and specifications of ships must be presented to the Minister of Finance; (b) the steamers must rank in the highest class according to the British Lloyd's regulations; (c) the average speed of boats of over 1,000 tons register must be not less than ten knots on six hours' trial; of under 1,000 tons, not less than eight knots at Lloyd's lower load line. To enable shipowners to repay the loans two measures are proposed. First, the loans will be on long time—20 years—without interest; secondly, the Government will bear part of the expense of insurance. To facilitate the export of Russian goods by steamers built in Russia, it is proposed to allow a rebate of half the expense for Russian coal used on all steamers carrying less than three-fourths of a full cargo on export and one-half of a cargo on import. It is estimated that the unavoidable calls made on the Government treasury by these plans to foster home shipbuilding will not be so large as they would be in case of payment of direct navigation and shipbuilding premiums. The issue of these regulations was fully discussed, and they were considered ready to be sanctioned by the Government Council. It was, however, decided that the proposals should first be published in the press of the Russian Empire, in order that the authorities might have the advantage of criticisms or suggestions from interested companies or individuals. It seems that this had to be done on account of the diversity of the interests involved. In the meantime, however, it has been decided that all Russian merchant ships shall be registered, and that comparative statements of the methods of navigation in Russia and in other commercial countries of the world shall be compiled.

Russo-Italian Service to America.—The new steamship service between Odessa, Naples, and New York will be opened at the beginning of November next. Three large steamers belonging to the Russian Volunteer Fleet, the *Peterburg*, *Saratoff*, and *Orel*, have been detailed for the service.

Siam.—RAILWAYS.—The American Consul-General in Siam devotes an interesting report to the position of railway enterprise in that country. He says that the three great highways of Siam from remote times have been three splendid rivers, which penetrate the country to its northern boundary, and with their numerous tributaries bring its plains into communication with the sea. To these natural highways, in later years, were added canals that intersect the alluvial plains of the south in every direction, making a vast network of waterways, thousands of miles in length. About ten years ago the first effort towards railway construction was made. This resulted in the Paknam line, which was opened to traffic in 1893. It is owned by a local company and is under Danish control. It is about 16½ miles in length and runs between Bangkok and Paknam, a flourishing village at the mouth of the Menam, at which all vessels stop on the way in and out of Bangkok. The line is now paying about 7 per cent. dividend. In 1892 the Government began the construction of the line from Bangkok to Muang Khorat, a good-sized town north-east of the capital. This was formally opened in December, 1900, when the work was completed over the entire distance of 102½ miles, traffic being carried on over the western end of the line as it was built. The country through which this railway runs is in part a rich alluvial plain, which improved communication will convert into a valuable rice-producing and grazing area. The Khorat hill region may also yield minerals, and some valuable woods are found there. From this line, 57 miles north-east from Bangkok, another branch runs to the north. This is completed about 26 miles to the town of Lopburi and will be extended in time to the town of Kiang-mai, a distance of 373 miles. The Director-General is sanguine that the road will be completed to Kiang-mai within six or eight years, and will advise its immediate extension to Kiang-Sen, 124 miles farther, on the Siamese border. It will pass through some rich agricultural regions, will probably open valuable mineral lands, and will penetrate the great timber areas of the country. On the other hand, it will have the river to compete with in almost its entire length, and the latter will no doubt at all times monopolise the timber traffic. As a political measure, the road will no doubt prove a good investment, and will do much for the commercial development of the country as well. The supplies are ready, the surveys completed, and the construction is being pushed on of a narrow-gauge line that will run from Bangkok south-west to Pechaburi, a distance of 94 miles. The preliminary surveys are also being made on another Government line, which it is proposed to run east and south from Bangkok through Paatrew and Bang-pla-soi to Si-ma-ha-ra-tha on the coast, about 87 miles distant. This line will, for perhaps 56 miles, serve a rich and well-populated region. For the rest of the way it will skirt the coast. Besides these Government lines there have been two private concessions for railways recently granted to Siamese. One of these will extend from Taurua, a station on the Lopburi line, to Prabat, a distance of about 10½ miles. This is a narrow-gauge line, and will probably be finished this year. It passes through a promising agricultural area, and it is proposed to extend the line, as trade develops, into the region beyond Prabat, which is rich in minerals and forests. The other line, beginning at Bangkok, will extend south-west through one of the richest and most thickly-populated areas of Siam and find its terminus at the mouth of the Tatien river. The capital has already been raised in Bangkok, and the company is under Siamese control. This is also a narrow-gauge line, and will be completed before the end of next year. So far it has been the aim of Siam to keep her railways in her own hands.

Steam Turbines.—The use of the compound steam turbine was commenced in this country in 1884 for driving dynamos; by 1890 about 360 such plants had been set to work; by 1896, 600 turbo plants had been sold, the total aggregate at that date being 40,000 horse-power, and the largest individual plant was 600 horse-power. According to *Engineering* at the present time 800 turbo plants have been sold, aggregating 200,000 horse-power, the largest being of 3,000 horse-power.

OFFICIAL AND COMMERCIAL CONTRACTS. UNITED KINGDOM.

Bury.—TENDERS are invited until the 20th inst. for—**CONTRACT No. 1:** The CONSTRUCTION of a STORAGE RESERVOIR (including an earthen embankment, 1,200 ft. in length and 60 ft. in depth, with puddle trench and wall, byewash channels, waste weir, valve tower, outlet tunnel, meter house, and other appurtenant works) on the Ogden Brook, situate in the township of Haslingden and county of Lancaster.—**CONTRACT No. 2:** PROVIDING and DELIVERING at Grane Siding of the Lancashire and Yorkshire Railway Company SLUICE VALVES, GIRDERS, and JOISTS, required in connection with the construction of the Ogden Reservoir.—**CONTRACT No. 3:** PROVIDING and DELIVERING at Grane Siding of the Lancashire and Yorkshire Railway Company 277 tons of CAST IRON PIPES, from 6 ins. to 36 ins. diameter, and 25 tons of special CASTINGS, required in connection with the construction of the Ogden Reservoir. Particulars (£5 for Contract No. 1, £1 each for Contracts Nos. 2 and 3) may be obtained from Mr. J. Cartwright, Peel Chambers, Bury, and 29, Old Queen-street Westminster.

Great Western Railway.—TENDERS are invited until the 7th inst. for the CONSTRUCTION of the PORTION of the Cheltenham and Honeybourne Railway from Honeybourne to Toddington (about 10½ miles). Particulars may be obtained from the engineer, Paddington station, London.—TENDERS are invited, until the 7th inst., for the SUPPLY of ENGLISH ASH, BUTTS, and PLANKS, Elm Butts, Planks and Boards, and Poplar Planks. Particulars may be obtained from G. K. Mills, secretary, Paddington station, London.

London.—TENDERS are invited by the City Corporation, until the 10th inst., for the SUPPLY of NEW SANITARY FITTINGS and other works at the ARTIZANS' DWELLINGS, Stoney-lane. Particulars may be seen at the office of the engineer to the Corporation, at the Guildhall.—TENDERS are also invited, until the 10th inst., for the ERECTION and COMPLETION of NEW BATHS at the ARTIZANS' DWELLINGS, Stoney-lane, according to plan and specification to be seen at the office of the engineer to the Corporation, at the Guildhall.—The London County Council invite TENDERS, until the 14th inst., for the MANUFACTURE, DELIVERY, and ERECTION COMPLETE of EIGHT SETS of NEW CONDENSING PLANT, with Piping and all Accessories, for the Main Pumping Engines at the Abbey Mills Pumping Station, in Abbey-lane, West Ham, Essex. Particulars (£5) may be obtained at the Engineer's Department, County Hall, Spring-gardens, S.W.

Middlesex.—The Light Railways Committee of the Middlesex County Council invite TENDERS, until the 7th inst., for the WORK and MATERIALS required in the CONSTRUCTION of the PERMANENT WAY (for ELECTRIC TRACTION), BRIDGE WORK, etc., of the following LIGHT RAILWAYS, viz.:—**Contract No. 1.**—Railway No. 1.—A line of double track (with cross-overs, contingent works, etc.), to be laid along Lordship-lane and Bruce-grove, in the districts of Wood-green and Tottenham, in the County of Middlesex, having a length of 1 mile 7 furlongs 68 chains or thereabouts. **Contract No. 3.**—Railway No. 3.—A line of double track (with cross-overs, contingent works, etc.), to be laid along the Archway and Great North Roads, from Highgate-archway to Whetstone, in the districts of Hornsey and Finchley, in the County of Middlesex, having a length of 4 miles 6 furlongs 15 chains or thereabouts. **Contract No. 5.**—Railway No. 5.—A line of double track (with cross-overs, contingent works, etc.), to be laid along the Edgware-road, from Cricklewood to Edgware, Hendon, Kingsbury, and Hendon Rural, in the County of Middlesex, having a length of 4 miles 6 furlongs 8 chains or thereabouts. Particulars (£5) may be obtained from H. T. Wakelam, M.I.C.E., county engineer, Middlesex Guildhall, Westminster, S.W.

Manchester.—TENDERS are invited, until the 29th November, for the RECONSTRUCTION of PRINCE'S BRIDGE over the River Irwell. Particulars (£5. 5s.) may be obtained from the town surveyor, Town-hall, Manchester.

Southend.—TENDERS are invited by the Southend Gas Company for the SUPPLY and ERECTION of a VIADUCT, commencing at their Gas Works to and along the foreshore, to be constructed of Steel Girders and Cast Iron Columns, etc., with Wood Decking and Steel Tramrails complete. Particulars (1½ guineas) may be obtained from the engineer at the Gas-works, Southend-on-Sea.

Wallasey, Cheshire.—TENDERS are invited, until the 15th inst., for the execution of certain BORING WORK at the Liscard Waterworks, Sea View-road, Liscard. Particulars may be obtained from Mr. J. H. Crowther, Great Float, near Birkenhead.

COLONIES.

Malta.—TENDERS are invited, until the 17th inst., for the SUPPLY of STATIONERY for the service of the civil departments in Malta. Particulars may be obtained at the Government Printing Office, Valetta, or at the office of the Crown Agents for the Colonies, Downing-street, London.

South Australia.—TENDERS are invited, until the 29th inst., for the SUPPLY of RAILWAY MATERIALS at Adelaide. Particulars may be obtained from the Agent-General for South Australia, Crosby-square, Bishopsgate-street, E.C.

INDIA.

Bengal-Nagpur Railway.—TENDERS are invited, until the 9th inst., for 1,000 COAL WAGONS. The wagons are to be of steel throughout, on underframes 19 feet 3 inches by 9 feet 4 inches. Wheels and axles are not required. The specification and form of tender can be obtained at the Company's office, No. 132, Gresham-house, Old Broad-street, E.C.

FOREIGN COUNTRIES.

French Indo-China.—TENDERS are invited until the 8th November for the SUPPLY of THREE STEAM LIGHTERS for the port of Haiphong. Particulars may be obtained at the offices of the Inspector-General of Public Works of the Colonies, or the Minister for the Colonies, France, or at the offices of the "Service de la Navigation" at Saigon, Hanoi and Haiphong.

Norway.—TENDERS are invited until the 7th inst., for the SUPPLY of ARMY CLOTHING and EQUIPMENT. For particulars address, Hovedforvalteren, Armeens Munderings Depot, Christiania.—TENDERS are also invited until the 7th inst., for the SUPPLY of 15 STATION CLOCKS. Particulars may be obtained from the traffic director, Norwegian State and Main Railways, Christiania.

Peru.—The Corporation of Callao invite TENDERS for about 2,400 tons of STRAIGHT CAST-IRON PIPES varying in diameter from 21 ins. to 2½ ins., also a quantity of special castings, tees, crosses, valves, hydrants, etc. Particulars (£5) may be obtained from Messrs. Graham, Rowe and Co., Mersey-chambers, Liverpool. Tenders to be sent in by the 15th inst. in order that they may be delivered at Callao by November 29.

COMMERCIAL LAW INTELLIGENCE.

Marine Insurance.—In the King's Bench Division Messrs. BROWN BROTHERS sued Messrs. R. T. FLEMING, W. SCOTT, E. VALLANCE, and S. G. HALL, underwriters, to recover £88 for damage to 228 cases of whisky shipped by plaintiffs from Glasgow to Singapore on the 31st July, 1899. Defendants had insured the whisky, which was packed in straw, and bore a label stating that it was "Brown Bros.' fine old Glasgow liqueur whisky." When the goods arrived at Singapore it was found that sea-water had got to the casks, saturated the straw in which the bottles were packed, and had washed off or obliterated the labels, and discoloured the bottles. Plaintiffs were unable to sell the whisky as of the brand which the labels bore, and had had to sell it partly by auction and partly by private tender for a less price than it would otherwise have realised. Defendants contended that they did not insure the labels, etc., but the whisky, which was delivered all right, and therefore they were not liable, as the loss was not covered by insurance. A month elapsed before the damages were notified to the agents at Singapore, and there was plenty of time in the interval to procure fresh labels. His lordship (Mr. Justice Bigham) held that it was not only the whisky which was insured but the labels and everything in connection with it. He gave judgment for plaintiffs for £70 and costs.

The Costs of a Patent Action.—In the Lord Mayor's Court, before Mr. F. S. Jackson, the Assistant Judge, and a jury, an action was tried in which Mr. A. B. ROBERTSON, an electrical engineer, of Union-street, Aberdeen, sued the GENERAL INCANDESCENT COMPANY (LIMITED) for £32. os. 8d., being the amount paid by him as the taxed costs of certain proceedings brought by the Welsbach Incandescent Gas Light Company (Limited) against the plaintiff in the Scottish Courts, against which payment it was said the defendants had agreed to indemnify the plaintiff. Mr. Herbert Jacobs was counsel for the plaintiff; and Mr. Glasgow for the defendants. The plaintiff had purchased for the purpose of sale certain incandescent mantles from the defendants upon a guarantee that the mantles were not an infringement of any other patent, and also upon what was said to be an undertaking to indemnify the plaintiff against loss by any action or proceedings of the Welsbach Company. Afterwards the latter company took proceedings against Mr. Robertson in the Scottish Courts to restrain him from selling the mantles, and obtained an interim injunction against him. The present defendants, notwithstanding that, wished the present plaintiff to continue the proceedings, but as they failed to comply with Mr. Robertson's request that they should deposit £50 towards his costs in the matter, contending that their guarantee was sufficient, Mr. Robertson declined to proceed further. He now sought to recover from the defendants the costs which he had paid. For the defence it was stated that the defendants were prepared to pay all the expenses if the plaintiff had allowed the defendants to conduct the action to a finish, although under the strict terms of the guarantee they were not bound to indemnify the plaintiff against such costs. The questions left to the jury were (1) whether it was reasonable for the plaintiff to ask the defendants to deposit £50 towards the costs of the further litigation between the Welsbach Company and the defendants; (2) whether the person who called on the plaintiff in April was an agent of the defendant company; and (3) whether he entered into a contract with the plaintiff as contained in a circular which had been referred to. The jury found for the plaintiff on all issues, and judgment was entered in his favour for the amount claimed. A stay of execution was granted with a view to an appeal.

War Risks: Confiscation of Goods for the Transvaal.—In the Court of Appeal, before the Master of the Rolls and Lords Justices Stirling and Cozens Hardy, the case of DUNN AND OTHERS v. DONALD CURRIE AND CO. and BUCKNILL BROTHERS was concluded. This was an appeal by both defendants from a judgment of Mr. Justice Mathew, given in the Commercial Court. The plaintiffs, Sir William Dunn and others, were shippers of goods by the defendants' vessel, the *Mashona*, from New York to ports in South Africa. They claimed damages for loss they had sustained from delay in the delivery of the goods at their destination, which they alleged was due to the reckless conduct of the defendants in loading on board other goods which were liable to confiscation. This part of the cargo mainly consisted of food-stuffs, which, it was said, were intended for the Boer troops. The Master of the Rolls, who read the judgment of the Court after stating the facts, said the first question in this case was whether the defendants had brought themselves within the exception for liability for loss from delay in the bill of lading, and they said that they had, because there was no evidence that although the delay was due to the fact that they had shipped cargo for delivery in the Transvaal, that they had any ground for supposing that the ship on that account would be arrested. They said that they never intended to land the food-stuffs unless they received the sanction of the British Government, and that they had reasonable grounds for assuming that they would be allowed to do so. It seemed to the Court that what the defendants had done was recklessly to take the risk of the ship being boarded and detained, and they could not see how their conduct was any defence to the plaintiffs' claim, for it would be certainly a startling contention that a liability for consequences of an act done negligently would be excused if it was shown that the act was done deliberately. Therefore the plaintiffs were entitled to damages. The appeal failed, and would be dismissed with costs. On the application of Mr. Carver, a stay was granted.

BRITISH CONSULAR REPORTS.

Guatemala.—In a recent report on Guatemala, the British Consul states that the general condition of the country has undoubtedly improved during the last two years. Foreign trade has increased, improvements are being made in agriculture, the crops have been satisfactory, the area under cultivation has increased, and it is hoped that soon it will no longer be necessary to import products such as wheat, maize, beans, and rice, which can be grown with little expense and labour in the country itself. The construction of the northern railway and carriage road has progressed, and these, when completed, will not only largely increase the trade of the country, but will develop and bring under cultivation large tracts of country through which they pass. A drawback to progress has been the damage caused by the earthquakes of April last, by which many towns were almost wholly destroyed. The injury to plantations, houses and machinery was so great that it must seriously affect the coffee crop, especially as the districts which suffered most are those in which coffee is grown. There is a considerable importation of machinery to Guatemala for the planting industries. The plant required on the coffee plantations is mostly from the United Kingdom, while that for sugar is from the United States. The Consul enters into some detail on this point, taking the use of one large and well-equipped plantation, and specifying the various machines used and the quarter from which they are obtained. He also gives a list of the machines imported (and the manufacturers supplying them), by two German, one Dutch, and one Belgian importing houses in Guatemala. The financial condition of the Republic

has improved considerably. The net revenue last year was nearly 13½ million dollars, of which the Customs yielded 8½ millions, and the excise 3½ millions. In 1900 the revenue was less than 8 millions. In his report for last year the Minister of Finance stated that the country had only partially succeeded in overcoming the fiscal crisis which had afflicted it for several years, "and, as will be granted by those who reflect, if such returns are maintained or increased from day to day, as it is natural to expect, the actual necessities of the public service would be provided for, if it were not for the weight of liabilities which for years back has burdened the fiscal situation of the Republic." Expressed in local currency, the total debt is over 92 million dollars, of which about 1½ million sterling is in gold, and 27½ millions in dollars, national currency. Or, if the whole be put in sterling, the liabilities at the end of last year amounted to £2,564,669, and the assets to £922,121.

Paraguay.—In his latest report H.M. Consul describes the condition of trade in Paraguay as very unsatisfactory, as the exceptionally high premium on gold has in many instances rendered business impossible, besides which the Asuncion market has been overstocked. A financial panic, which threatened at one time, was averted, and the few cases of insolvency were amongst unimportant firms. Trade is larger than might be expected, having regard to the want of means of communication and to other commercial deficiencies; but it is chiefly carried on by European firms in Buenos Ayres and Montevideo, and varies little from year to year. Most European articles are obtainable at prices which are not unreasonable, considering the freight and high duties. There are 25 large importing firms in Asuncion, all selling British goods, but there are no trade statistics. The premium on gold has varied from 800 to 1,000 per cent., and touched the latter figure at the end of last year. The total public debt is just over six millions sterling, of which over four-and-a-half millions is the amount of the non-interest-bearing funded debt. The revenue was £616,829 in 1900, against £310,507 in 1890; the expenditure in the same years respectively was £725,181 and £162,129. The imports last year were estimated at a little over £600,000; the amount from the United Kingdom was probably a quarter of this, and a German Consular report places the average annual imports from Germany at about the same amount. The exports are estimated at a little more than half-a-million sterling, and it is believed that the volume of both imports and exports has increased during the last few years. The main exports are yerba maté, hides, timber, tobacco, and fruit. Amongst the skins there is an abundant supply of alligator skins, varying in the raw state from 15d. to 4s. each according to length, and from 5s. to £1 when tanned. The maté, or Paraguayan tea, goes largely to the other South American Republics; there seems little doubt, says the Consul, that it is a great restorative in hot weather, or after physical exhaustion. The fruit goes to the Argentine and Uruguay. Cattle breeding is the most important industry in the country, and there is a slow improvement taking place in the stock. The number of horned cattle in the Republic is estimated at three-and-a-half millions, and the number slaughtered in Asuncion last year was over 33,000 head. A breakwater for Asuncion harbour was commenced last year. The Consul, in conclusion, states that the Paraguayan Chamber of Commerce supplies to all applicants, free of charge, information regarding the commerce and finances of the country.

Persia (Baghdad).—THE TIGRIS AND THE TRADE OF BAGHDAD.—The acting British Consul-General in Baghdad, in a report on his district for the past year, says that no description of the trade of the district would be complete without reference to the magnificent river Tigris, which is the chief means of communication between it and the outer world. The navigation, however, is growing increasingly difficult owing to the neglect of dredging, and the absence of supervision over the local Arabs, who cut channels and primitive canals in careless and unsentimental ways. These cause the river to silt up, or to open out into broad shallows at awkward places, and thus lead to the restriction of steamer traffic, which helps largely to keep open the existing channels. If the proper preservation of the river received attention, the trade of the town and adjacent districts would be increased, and the country would be developed to an extent that would amply repay the expenditure on the river. The export of wool declined last year, owing to great mortality amongst the Arab flocks on account of unfavourable weather leading to a scarcity of pasture. The market for mohair also was bad, as was that for galls from Mosul. Nearly all grain crops were short and of inferior quality owing to the lack of rain and the low water in the Tigris, but the date harvest was excellent in quality as well as quantity, and the poorer classes fell back on dates more than ever, in consequence of the scarcity in grain. The main exports from the district are wool, which is by far the most important of all, gum, galls, skins and hides, carpets and mohair. The carpets are from Persia, Baghdad being merely a place of transit. The import trade in piece-goods was large last year, the demand from Persia and Kurdistan being considerable, and it was this trade that suffered chiefly by the deficiency in navigation, as bales of goods sometimes remained at Basra for months before they found a conveyance to Baghdad. The Euphrates and Tigris Company alone conveyed cloths to the value of over one million sterling to Baghdad last year. This trade is increasing, owing to an extension of the system of giving long credits to small dealers by firms having the control of goods consigned for sale by manufacturers at home.

Philippines (Manila).—From a report of the British Consul at Manila it appears that the islands are pacified, but in an impoverished condition consequent on the events of the past five years. Not only has there been great loss of life among the natives owing to war, but rinderpest and a disease called "surra" have reduced the supply of draught animals to such an extent that all cultivation is seriously hampered. Rice, the staple food of the islands, has suffered most seriously, as not only has the actual amount planted been smaller than usual, but owing to drought the last year's crop was light. British trade occupies a predominant position in the Philippines, but the fact must not be overlooked that large quantities of goods transhipped at Hong Kong and Singapore figure as British and swell the totals, although produced in other countries. In 1901, out of a total of imports valued at \$32,758,095 gold, \$15,545,734 worth came from various British or Colonial ports. These paid \$3,183,055 duty out of a total of \$6,394,915. Imports have increased from \$24,284,666 in 1900 to \$32,758,095 in 1901, the increase being mainly due to a much increased civil population, whose food, drink, and clothes all have to be imported. As regards exports, a total value of \$13,783,179 gold went to British ports out of a gross export of \$20,760,648, paying duty to the amount of \$402,073, out of a total of \$669,085. The total quantity of hemp exported in 1901 amounted to 913,349 bales, of which 781,838 bales were shipped by British firms. A large reduction in exports to the United Kingdom may be expected in the current year, owing to the abolition of the export duty on hemp sent to the United States, as this product will then have to be shipped direct to the United States of America to obtain this privilege. The total quantity exported will probably increase largely in the next few years, as, tranquillity being re-established, larger areas will be planted with this valuable crop, which is not hard to cultivate and is popular with the natives. The export of leaf tobacco was below average. Only the cheaper qualities of cigars are sent to the

United Kingdom, the better classes apparently being unable to compete with Mexican and West Indian cigars in home markets. Australia and the China coast are, however, good customers. A new tariff came into effect in November, 1901, which has in many cases raised the previous duties, although it was intended only to raise those on luxuries and reduce the charges on necessities.

Zanzibar.—In his report on the trade of Zanzibar for 1901, the British Vice-Consul states that the Customs returns show a net revenue of £75,025, an increase of £7,169 on that of the previous year, chiefly due to an improvement in the value of cloves entering the Customs-house from various parts of Zanzibar and Pemba islands, and brought to this town in dhows. Cloves show an increase in revenue, as compared with the year 1900, of £8,171, owing to a good crop. This fact is only mentioned as a matter of interest and as showing the healthy conditions of the islands as regards the clove produce. Apart from the above-mentioned cause, the import trade shows an increase of, in round numbers, £80,000, while the value of exports is also greater, though to no very appreciable extent. Imports from the United Kingdom show a slight improvement. The value of piece-goods imported from London, Liverpool, Manchester, and Southampton contributed to this increase with a total of £39,724, as against £37,155 in the year 1900. The amount of coal from Cardiff slightly decreased, but only to the extent of £1,988, an insignificant fall as compared with the previous year, when a decrease of £31,000 had to be reported. The outlook is promising, for if during a year of commercial depression in the United Kingdom, there has been no diminution of the goods which have entered or left the country, there is good ground for expecting still better returns in future years, when trade in the United Kingdom and in other parts of the world will have resumed its normal vigour. There is a decrease of about £4,000 in the value of imports from Germany which, among European countries, stands next to the United Kingdom in importance, but a rise of some £6,000 in the value of imports from the United States. Petroleum, however, one of the principal exports thence to Zanzibar, does not contribute to the increase, that article showing a decline in import value of £19,620, owing, probably, to the local bulk oil installation which has been established here by a British company, and also to the fact that Russian oil now competes largely with American case oil.

FOREIGN CONSULAR REPORTS.

Pineapples in the Bahamas.—According to the United States Consul, the average number of pineapples shipped from the Bahamas is about 6,000,000 per annum, worth some \$250,000 or \$275,000. The falling off this year, both in quantity and value, means a serious loss to the planters of this colony and a certain loss to the trade of the United States, which takes the entire crop, selling the colonists goods in exchange. It is estimated that from sixty to seventy-five cargoes of the fruit are carried to the United States in small, swift American schooners, which earn from \$40,000 to \$50,000 as charter money. The pineapple industry is developing new life, despite the threatening competition in the near future from Cuba and Porto Rico, and the plantations are being extended. So great is the demand for new plants, and so inadequate the supply, that the Colonial Legislature has just passed an act imposing an export duty on the plants of \$1.20 for the first hundred and \$2.40 per hundred for all above that number. Pineapple tops and slips are included in the term plants. An order for 170,000 dozen plants was lately received from Cuba. This act seemed necessary, as the shipments of plants to Cuba and Florida were becoming very large. The proprietors of canning factories here are much concerned over the apparent intention of the United States Customs authorities to consider all pineapples put up in tin cans, with ever so small a quantity of sugar, as "preserved" fruit, liable to duty at 1 cent per pound and 35 per cent. *ad valorem*. The canned fruit from this colony has heretofore been classified as "fruit in its own juice," and as such been dutiable at 1 per cent. per pound and 25 per cent. *ad valorem*. The new ruling, if it prevails, will increase the duty by 10 per cent., and, in the opinion of local packers, will seriously injure their business. The shipping and canning season covers the three months of May, June and July.

Miners and Mining in China.—The United States Consul at Tien-tsin says that the only mines in the country worked on modern methods are the coal mines at Tong-shan and Ling-si, belonging to the Chinese Engineering and Mining Company. About two-thirds of the work is done by contract, the company paying so much a ton. The contractor employs the miners by the day, and pays them from 4d. to 6d. for eight hours' work. Besides their wages, the miners obtain a certain part of the net profits of the contractor. In addition to men doing contract work the company employs a large staff of miners, coolies, masons, carpenters, overseers and deputies, besides about 100 boys, who look after the ventilating doors. In the Tong-shan mines about 1,000 men are engaged daily in three shifts of eight hours each, while 2,000 men are employed by the contractors in mining coal and doing stonework. The contract rates for mining are 6d. a ton for dust coal and 1s. 3d. for lump. In the other mines in the interior the primitive Chinese methods of mining are employed, and generally the miners are paid by a share. The usual rate is about one-third of the product to the miners and the remaining two-thirds to the owners of the mines. An entirely different system of paying the miners was adopted by the Mo-ho Gold Mining Company, which had extensive mining rights between Mongolia and Asiatic Russia, embracing hundreds of square miles of rich alluvial and placer deposits. For the successful exploiting of this vast mineral wealth it was necessary to overcome the obstacles arising from distance, severity of climate, and total want of labour. To meet the latter difficulty the company offered a complete outfit to every able-bodied man from North China, besides advancing a substantial sum for the expenses of the journey from Tien-tsin or Chi-fu to Mo-ho. Upon arrival each miner was assigned a large area for his exclusive exploitation. Stations were established at different points throughout the whole region, guarded by the military police furnished by the Government. The miner had to sell all his dust to the company, at a price fixed by the latter, and obtain all supplies from the company's stores. By this arrangement the company is able to recoup the original outlay, which was very heavy, and the miner was given an incentive to work. Many of the miners after the first two years became rich, while on the various occasions the company declared an annual dividend of 150 per cent. Up to the Boxer uprising of 1900, the company was the most profitable mining enterprise in China. Since the Russians have acquired control of this territory, all mining operations have ceased.

The Consul at Niu-chwang says that an experienced mining engineer has just returned from a journey into the country at the head-waters of the Yalu, where he went to inspect several gold-mining properties as the representative of an American syndicate. His route was to Mukden by train, and thence 200 miles east by cart and chair. The natives informed him that only one white man had ever before visited that region. He found the country extremely rich in agricultural products, which find their way down the Yalu river to various parts of

China. Timber is one of the most important resources. He saw many logs 4 ft. in diameter, from 40 ft. to 80 ft. long, and of very fine quality, floating down the Yalu; they are then loaded on junks for various ports in China, large numbers going to Tien-tsin. Quantities of coal, both anthracite and bituminous, are mined and used by the natives. Coke of excellent quality is one of the important exports from the Yalu river. All Southern Manchuria seems to be remarkably well supplied with coal. Gold placers have been worked on the Yalu and its tributaries for ages, and many placer claims are still producing well, although worked in the crudest way. Sluice boxes are only 6 ft. long, and are without any arrangements for saving the fine gold; only the coarse is collected. There are many evidences of quartz reefs. Ledges worked by the natives indicate considerable value; but as the people know absolutely nothing of how to work quartz mines, and have no tools, not even hand drills, very little can yet be determined as to them. The expense of reaching the country and the introduction of mining machinery would not be great. The cost of labour and fuel would be as cheap as anywhere in the world.

The Import Trade of Mesopotamia.—The Russian Consul at Basra throws some welcome light on the economic conditions of a region which, says *The Times*, is steadily acquiring increased international interest. A gradual change has taken place in the direction of import trade in Mesopotamia since the opening of the Suez Canal. Basra, with its purely Arab population, is now the chief emporium of the district for foreign imports. These reach Basra by way of the Shatt el Arab and the Tigris, and from that centre they are forwarded to Baghdad and more distant parts of the interior. River navigation is provided by four Turkish steamers, two steamers belonging to the British firm of Lyneh Brothers, and by native sailing vessels. From a comprehensive analysis of the commerce of the region, it is apparent that the steamers engaged in this trade are far from being sufficient for its requirements. This is all the more noteworthy as the traffic is represented to be very remunerative, and several proposals have lately been made to found a new steamship company to develop the inland navigation. It is to be hoped that these hints will not be lost on British merchants interested in the trade of this region, and that they will not allow their Russian and German rivals to get ahead of them in a quarter of the globe which promises to be of very special importance at no distant date. British trade has the great initial advantage of cheap access by water to the principal emporium.

CHAMBERS OF COMMERCE REPORTS. UNITED KINGDOM.

Liverpool.—COTTON-GROWING IN WEST AFRICA.—Presiding at a meeting of the African trade section of the Liverpool Chamber of Commerce, Sir Alfred Jones asked that a resolution should be adopted thanking the West African Government and the Colonial Office for the interest they are manifesting in cotton-growing in West Africa. Such resolution was passed. Sir Alfred said he had forwarded to the West African colonies 100 tons of cotton seed for planting purposes, and the reports on the growth were highly satisfactory. A letter was read from the New Cotton Fields (Limited), of London, intimating that they would gladly forward particulars of its plans, etc. Sir Alfred Jones referred to the Cotton-growing Association started at Oldham and Manchester, and said there was no doubt cotton-growing on a large scale would eventually take place in West Africa. Sir Ralph Moor had asked for two mules for ploughing cotton, and these with complete harness had been forwarded to him as a present. Sir Alfred submitted a sample of cotton grown in Sierra Leone in three months after the seed was sown. This sample had been sent by Dr. Blyden, from whom a letter was read stating that the sample, which was not the best procurable, was grown at Mabang, three hours' rail journey from Freetown. The doctor continued:—"The seed was planted rather early in the year. The best time for planting cotton in this part of Africa is the first week in September. The soil was worked with the ordinary native implements, which only scratch the earth. A large portion of the seed was in an unhealthy state. What are needed, Dr. Abayami Cole, who grew the cotton, says, for producing the best results, are ploughing the soil with the help of a mule, and a cotton gin. Nowhere in Africa have these helps been employed by the natives in the production of cotton. The samples usually seen, and from which the natives obtain the millions of country cloths, are cultivated with these ordinary tools, or grow wild and are prepared for market with the hand. Their cotton cannot, therefore, be compared to cotton produced in America under the most favourable conditions. Who can tell the agricultural possibilities of Africa under the agencies and manipulation of civilised knowledge? If with Dr. Cole's limited means he has produced an acre of cotton in three months, why may not 1,000 or 10,000 acres be produced in the same time with adequate capital. Liverpool, with the capital she can command, ought to be able to put on the market by next September at least 1,000 tons of cotton, and go on doubling the production until she shall be largely independent of America."

COLONIES.

Cape Colony (Port Elizabeth).—At the last annual general meeting of this Chamber, held on 7th April, the President, Mr. W. Macintosh, said, in moving the adoption of the report, that for the third year in succession he had to call attention to the fact that the past had been a year of war. But this year they had to report something more than that. They had to report the fact that martial law had been proclaimed in this district, they had to report upon the peculiar state of Parliament, and, in fact, upon the peculiar condition of the whole colony, which was crying out, above all things, for peace. But he would reiterate what he had said in previous years, that they did not mean that they wanted peace at any price. They wanted peace on terms which should ensure them having permanent peace in this country.

The annual report, in some ways, was got up in a new style, which would be generally approved of. They had included the figures of Natal in the Trade Returns, so as to give the figures of the trade of the whole of South Africa. In turning to the statements dealing with the imports, they would see that there had been a large increase in imports; in fact, as the report stated, it was the greatest year the country had ever had, the value of the imports coming up to nearly twenty millions sterling. Unfortunately they could not look upon that as indicative of the general prosperity of the country. It simply meant that there had been prosperity for certain districts and for certain persons; but they knew that the increase in the imports was largely due to the fact of there having been a large military expenditure in the country. The most notable thing about the imports was the large amount of importations into Cape Town. The importations into Cape Town amounted, for the past year to nine and a quarter millions, or about double what they were for the year prior to the war. Port Elizabeth had last year to go back to the figures for 1898, some six millions odd. Of course, the large increase in the importations for Cape Town were due to the large extra population of that place during the year, and also to

the fact of its being the centre or headquarters of military expenditure. It might also be due to other causes, but they all knew that importations through the various ports were upset at the present moment and it was impossible to judge what the after-war effect would be.

The exports had been increased also during the year, but they were still considerably short, even exclusive of the gold exports, of what they were prior to the war. He was afraid that it was inevitable that after the war it would take a long time before the figures could reach the total at which they stood prior to the war.

If they turned to railways, they would find that there was only one item which they were able to give. The general manager's report had not yet been issued, and the figures given only dealt with the earnings for the past year. Taking all the systems, the total earnings were £4. 8s. 4d. per cent., as against £6. 5s. per cent. for the previous year. It was a tremendous drop. They could understand why the Midland system should be so low, because the Midland railway had been principally used for military traffic. But the total was certainly surprising. He had been informed, however, that this was partly due to the fact that the earnings had this year been reckoned on a new basis. In former years any amount spent on new rolling stock was added to capital account, without reference to stock which had worn out and had to be replaced. This year earnings were debited for stock which had to be replaced, which was distinctly an improvement and a correct method of working. Perhaps this might account for the big drop in the railway returns.

Taking their local interests in railway affairs, they would find in the report full details of their troubles during the past year, for it had been nothing but a series of troubles. They knew that military requirements had a great deal to do with them, but they thought that many things might have been remedied which were not dependent upon the military. That there should have been a shortage of trucks for civil traffic was perhaps excusable, but that there should have been trucks available which had to be stopped when loaded for the want of tarpaulins was not a sign of military occupation, but a sign of railway mismanagement. That had been the case this week. They thought here that this was due to their traffic manager not being given sufficient power. They wanted to see less centralisation of power in Cape Town, and more power given to the traffic manager of the Midland line.

Turning to Harbour Board affairs, the figures show that the tonnage dealt with during the year was something over one million. This was the biggest figure they had ever reached. The prosperity of the port depended more than anything else upon railway rates and railway routes. They had been endeavouring during the past two or three years to get into communication with other States to get some assistance in these matters, but the whole thing had been hung up. Recently, however, they had read in the Natal Parliament that it had been decided that there shall be a Railway Conference between representatives of all States to deal with railway rates, so that each State shall get a fair hearing and voice in the decision. Nothing better could be wanted. But they thought that in a matter of this sort there should be mercantile representatives at the conference, because it was a matter which affected the mercantile community very largely. They were pleased to hear that there was to be a railway conference, they knew there would also be a Customs conference, and these conferences would prepare the way for a federation of all South African States. He had said that railway rates were the principal thing, but before they could get goods on to the railway, they had to get them ashore by means of their harbour facilities. There was a diversity of opinion as to what the conditions would be after the war, but there was no diversity of opinion regarding the fact there would be a big tonnage to deal with. The Harbour Board Commissioners had partly dealt with the matter of increasing the facilities of this port, and the Government had been very willing to help them. The Don Pedro Jetty was to be extended, and soundings were to be taken at the north end, and also, he thought, at Zwartkops mouth. So their harbour commissioners were alive to the necessity of dealing with these matters, but they wanted to see their jetties constructed and their facilities increased in such a way as would enable them to be most economically utilized.

FOREIGN COUNTRIES.

Egypt.—The annual report for 1901 of the British Chamber of Commerce of Egypt states that the imports of piece-goods and yarns for 1901 show an increase in nearly all branches over those of the preceding year. The total of 28,780 packages—the largest quantity yet imported in twelve months—is divided into 23,723 packages of piece-goods and 5,057 packages of yarns.

Although Great Britain continues to send the bulk of the piece-goods in general, there is a remarkable advance in the imports of cotton flannelettes from the Continent. The returns would tend to show that British makers of this article cannot compete against their Continental rivals, as they have supplied only £173,828 worth against £173,312 worth from Italy, Austria, and Germany.

The figures for yarns include 1,751 bales from Italy, consisting almost entirely of the grey and bleached sewings, attempts to introduce Italian single yarns not having met with much success so far. It also includes 184 bales single yarns from India. The importation of yarns from India is the chief feature of the year. There is some reason to suppose that these 184 bales represent only the quantity arrived at Alexandria, in consequence of the Suez returns not being yet available.

In spite of the large arrivals which make 1901 a record year, it is doubtful whether merchants or traders can regard it with the same satisfaction as they regarded its immediate predecessor. There is evidence that the large imports were in excess of the demand. The market became overstocked, and great eagerness to sell was displayed with the usual deplorable results. The year closed with somewhat heavy stocks, which may, or may not, leave a margin on the right side, and with the market in a condition which cannot be truthfully described as healthy.

During the year the local mills have started work, and seem to find no difficulty in disposing of their produce. As this produce will have to be distributed in Egypt, it will naturally affect the imports from Manchester in proportion to its importance.

New Use for Rafia Fibre.—In the *Journal Officiel*, Tananarivo, is an interesting reference to the new experiment of employing rafia fibre for the manufacture of cigarette paper. The French firm which has taken this initiative is that of Messrs. A. & P. Duplat frères, 17 rue des Bons-Enfants, Marseilles, and samples are now in the Commercial Museum at Tananarivo. The paper presents the qualities of decided suppleness and strength and, as the fibre from the start is tasteless, inodorous, and exceedingly clean, it certainly recommends itself to the most fastidious. The attention of paper manufacturers, always in search of new productions, might well be turned to the possibilities of this fibre for other uses. These are too varied to quote, but will immediately suggest themselves to the scientific manufacturer who might be interested in following the experiments.

GENERAL INTELLIGENCE OF THE PAST MONTH.

September, 1902.

UNITED KINGDOM.

SEPT. 1st: The King and Queen arrived at Uig on board the Royal Yacht. The Trade Union Congress opened its 35th annual meeting. The Institute of Journalists opened their annual conference at Birmingham. The Scottish Horse arrived in Edinburgh from South Africa. A series of trials of motor vehicles was begun under the auspices of the Automobile Club. The provisions of the Crimes Act were extended to further counties and boroughs in Ireland.

2nd: The King and Queen visited Stornoway. Lords Mount Stephen and Strathcona presented to King Edward's Hospital Fund an endowment of £16,000 per annum.

3rd: Death of Lord Connemara. Lord Kitchener visited Powis Castle.

4th: The King and Queen visited Dunrobin Castle. Mr. Brodriek and Lord Roberts left London for Berlin to attend the German manoeuvres.

5th: Mr. Chamberlain held a conference with the Boer Generals at the Colonial Office. A meeting was held in Dublin to protest against the proclamation of the City under the Crimes Act.

6th: Mr. Chamberlain had a private interview with General Botha. Lord Kitchener distributed war medals at Welshpool. Death of Sir F. A. Abel, G.C.V.O., K.C.B., in his 76th year. Death of Mr. Philip I. Bailey, author of *Festus*.

8th: The King and Queen arrived at Balmoral. Mr. Seddon left London for New Zealand.

9th: Mr. Wyndham, Chief Secretary, visited the Cork Exhibition. The Boer Generals left London for the Continent. The Sanitary Institute began its annual congress at Manchester. The Welsh National Eisteddfod was opened at Bangor. The Institute of British Carriage Builders held its annual conference at Oxford. Death of Lady Macartney.

10th: The British Association began its annual meeting at Belfast. Death of Mr. G. H. Croad, Clerk to the London School Board. The Lord Mayor and Sheriffs of London visited Bath.

11th: The King and Queen were present at the Highland Braemar gathering at Cluny. The Secretary of Scotland appointed a committee to inquire into the constitution, powers and duties of the Board of Manufacturers. Death of Mr. H. R. Grenfell.

12th: A meeting of the Dublin Corporation denounced the action of the Government in proclaiming the city under the Crimes Act. The Lord Mayor of London was presented with an address of welcome at Exeter.

13th: A meeting of Nationalists was held in Phoenix Park, Dublin, to protest against the Crimes Act Proclamation. A congress of postal and telegraphic employes was held in the Holborn Town Hall.

15th: The British Archaeological Association opened its annual congress at Westminster. The Royal Commission on Physical Training in Scotland sat in Edinburgh. Mr. H. de Windt landed at Plymouth from New York.

16th: The Queen and Princess Victoria visited Lord Rosebery at Dalmeny. The Institute of Mining Engineers began their annual meeting at Newcastle-on-Tyne.

17th: The Queen and Princess Victoria left Queensferry for Copenhagen. The British Association concluded its meeting at Belfast. Death of General Sir Robert White, K.C.B.

18th: The King and the Prince of Wales took part in a deer drive in Abergeldie. Sir C. Dilke was the principal speaker at a miners' demonstration at Porth, Rhondda Valley.

19th: The cruiser *Terrible* arrived at Portsmouth.

20th: Mr. Balfour was presented with the freedom of the burgh of Haddington. Death of Rear-Admiral Burges Watson at Malta. A demonstration against the Education Bill took place on Woodhouse Moor, Leeds. The Grocery Exhibition was opened at the Agricultural Hall.

22nd: Lord Kitchener was presented with the freedom of Ipswich. The Catholic Truth Society opened its annual conference at Newport, Monmouthshire.

23rd: The Library Association opened its annual meeting at Birmingham. Captain Percy Scott and the officers and crew of the *Terrible* were entertained at a banquet at Portsmouth.

24th: The Lord Lieutenant of Ireland, Lady Dudley and Suite, left London for Dublin.

25th: Lord Dudley made his state entry into Dublin. Mr. J. O'Donnell, M.P., and Mr. J. Roche, M.P., were arrested for failing to attend the Crimes Act Court.

26th: Lord Roberts received the freedom of Bath, and unveiled a mural tablet to Lord Clive. The memorial window to the late Duke of Westminster was dedicated in Westminster Abbey. Lady Airlie opened the Dundee Sanatorium for Consumptives, near Auchterhouse. The Princess of Wales left Abergeldie for Perth, en route for London. Death of Mr. John Latey.

27th: The new Sheriffs of the City of London, Mr. Alderman Truscott and Mr. Brooke-Hitching, were formally admitted to office. The Lord Lieutenant received at Dublin Castle an address of welcome from the Dublin Chamber of Commerce. The National Federation of Assistant Teachers held their annual conference at Reading. Death of Sir Thomas Erskine.

29th: Alderman Sir Marcus Samuel was elected Lord Mayor of the City of London.

30th: The Cutlers' Feast took place at Sheffield. The National Sea-fisheries Protection Association opened their annual conference at Grimsby.

COLONIES.

Australia.—4th: The Federal House of Representatives agreed to waive the constitutional question as to the right of the Senate to send a second message urging amendments to the Tariff Bill. The Parliament agreed to allow the next Governor-General £5,500 per annum.—9th: The Federal Senate finally passed the Commonwealth Tariff Bill. **New South Wales.**—11th: The shearers' strike was ended.—17th: The Water and Drainage Bill was passed. **Victoria.**—10th: The Ministry was defeated in the Legislative Assembly on a clause in the Rerrenchment Bill providing for the reduction of salaries in the public service.—13th: Canon Lowther Clarke, Vicar of Huddersfield, accepted the Bishopric of Melbourne. **Queensland.**—24th: The Premier stated that the colony was dissatisfied with the result of federation.

Canada.—1st:—The National Guards from Albany, New York State, and the Hong Kong Coronation Contingent were reviewed by Lord Minto at Ottawa.—3rd: Sir E. Barton, Sir J. Forrest and other Australian visitors were entertained at a banquet at Toronto by the Board of Trade.—5th: The Dominion Millers' Association held their annual meeting.—15th: Lieutenant Peary, in the *Windward*, arrived at Sydney, Cape Breton.—20th: Sir E. Barton left Victoria, B.C., for Australia.

Cape Colony.—1st: A violent gale occurred in Algoa Bay and Port Elizabeth.—3rd: The House of Assembly passed the third reading of the General Indemnity Bill.—4th: A proposal of the Bond leaders for an enquiry as to the powers of School Committees was carried in the Assembly.—5th: The Harbour

Boards Loan Bill was read a second time.—9th: Sir G. Spriggs presented his budget, and stated that the Navy grant would be increased to £50,000 per annum.—19th: Martial Law was abolished, and the Peace Preservation Act put in force.—22nd: In the House of Assembly, Mr. Meriman's anti-suspension motion was carried.—23rd: Mr. Te Water was seized with paralysis in the House of Assembly.—26th: In the House of Assembly, the War Losses Additional Compensation Bill was read a second time.

Newfoundland.—7th: Mr. A. Lytte ton, the arbitrator in the Reid claims, tendered his resignation.—11th: Mr. Lyttelton consented to remain as arbitrator.

Orange River Colony.—4th: Special measures were adopted for the settlement of British and Irish agriculturists in the Colony.

Rhodesia.—6th: An outbreak of rabies occurring, the Indunas promised to destroy their dogs.

St. Vincent.—4th: Another violent eruption of the Soufrière was reported.

Transvaal.—1st: Sir A. Lawley, the new Lieutenant-Governor, held an official reception at Pretoria.—3rd: The number of natives at work in the Rand mines numbered only 5,209.—6th: The office of Military Governor of Pretoria was abolished.—11th: Lord Milner left Johannesburg on a tour through Western Transvaal. It was decided to charge £3,000,000 to the Imperial Exchequer for repatriating the Boer, and £2,000,000 to compensate British subjects, foreigners and natives.—17th: A new gold reef was discovered on the Rand.—23rd: The war debt of the Transvaal to the Imperial exchequer was stated to be £100,000,000. The number of natives working in the Rand mines was 36,363.—25th: The Martial Law Commission left Pretoria for Natal.

INDIA.

2nd: The rainfall was generally well distributed.—5th: It was announced that the Duke of Connaught would represent the King-Emperor at the Coronation Durbar at Delhi. The number of persons on famine relief was reduced to 450,000, a decrease of about 120,000.—15th: Great floods occurred in Southern Bengal.—18th: The number of persons on famine relief fell to 305,000.—22nd: Lt.-Col. W. H. Curzon Wyllie was appointed a K.C.I.E.—23rd: Mr. Nowrojee Manockjee Wadia, a Parsee of Bombay, offered to present £1,000,000 for the relief of the destitute deprived of subsistence by sudden calamities.—25th: The number of persons on famine relief fell to 287,000.

FOREIGN COUNTRIES.

Abyssinia.—19th: The Emperor Menelik received the Grand Cross of the Order of the Bath from King Edward.

Argentina.—4th: The drought continued. The Chamber rejected the Divorce Bill.

Austria-Hungary.—1st: Serious riots occurred in Agram between Croats and Serbs.—3rd: Martial law was proclaimed in Agram.—19th: The centenary of the birth of Kossuth was celebrated.—28th: The British Exhibition of Arts and Crafts was opened at Budapest.

Belgium.—1st: An International Congress with reference to the insane was opened at Antwerp.—18th: The Institute of International Law began its sittings at Brussels.—19th: Death of the Queen.

Bulgaria.—15th: The elections for the Sobranje resulted in a victory for the Government.—28th: It was reported that an insurrection had broken out in the vilayet of Monastir.

China.—5th: The Anglo-Chinese treaty was signed after an arrangement had been made regarding the surtax funds.—9th: Some alterations dealing with the abolition of *likin* were made in Sir J. Mackay's Treaty.—10th: Sir J. Mackay left Shanghai for England, via Japan.—12th: The restoration of Manchuria was delayed.—13th: The Emperor, the Dowager Empress and the Court moved into the Summer Palace at Peking.—29th: The Peking-Shan-hai-kwan railway was restored to the Chinese.

Colombia.—9th: Government troops were sent to Colon in anticipation of an attack by the rebels. Agua Dulce surrendered to the revolutionists.—15th: The rebel general Carreazo surrendered.

Denmark.—19th: Queen Alexandra arrived at Copenhagen.

Egypt.—11th: The cholera epidemic increased.—28th: The cholera commenced to decrease.

France.—1st: Sir W. Laurier was entertained at a banquet in Paris, M. Ribot presiding. The Shah visited the Louvre.—5th: Colonel de St. Remy was sentenced to a day's imprisonment.—7th: The Shah received the Spanish Mission sent to present him with the Order of the Golden Fleece. The Khedive visited the Shah. Colonel de St. Remy was compulsorily retired.—13th: The Shah left Paris.—25th: It was stated the French investments abroad amounted to 30 milliards.—29th: Death of Emile Zola, accidentally asphyxiated.

French Indo-China.—5th: News was received of a serious meeting of Annamite troops at Hanoi.

Germany.—3rd: The Delegates of the Iron and Steel Institute held their meeting in the Town Hall of Dusseldorf. The Emperor presented new colours to regiments of the 5th Army Corps at Posen.—4th: The Emperor unveiled a memorial to the Emperor Frederick at Posen.—5th: Death of Professor Virchow. Mr. Brodriek and Lord Roberts arrived in Berlin. The 13th International Congress of Orientalists was opened at Hamburg.—9th: The military manoeuvres commenced near the river Obra.—15th: The 13th German Socialist Congress was opened at Munich.—19th: A Congress of Bankers was opened at Frankfurt.—25th: The International Maritime Committee assembled at Hamburg.—28th: The Emperor issued new articles of war.

German West Africa.—13th: A concession was granted to a company for the construction of a railway from the coast to the interior of the Cameroons.

Haiti.—7th: The Firminist gunboat *Crête à Pierot* was sunk by the German cruiser *Panther*.

Holland.—9th: Death of Dr. Van Asch van Wyk, Minister of the Colonies.—10th: The Boer Generals arrived at the Hague.—15th: The Hague Arbitration Court was opened for the consideration of a dispute between the United States and Mexico.—16th: The session of the States General was opened by the Queen in person.—22nd: The Boer Generals visited Hamburg.—24th: The Boer Generals issued from Amsterdam an "appeal to the civilized world."

Italy.—8th: A serious peasant riot took place at Candela in Apulia.—20th: The anniversary of the entry of the Italian troops into Rome in 1870 was celebrated.—26th: Several buildings in Venice were reported to be unsafe. A cyclonic storm visited Eastern Sicily.

Japan.—16th: The Ministry agreed on a financial policy and decided to make no reduction on the land tax.

Morocco.—5th: The Berber tribes submitted to the Sultan's authority.—6th: Death of the Sultan's mother.—7th: The Sultan ordered a large army to be in readiness to leave Fez on December 1.—26th: The Sultan improved the Morocco prisons, and the condition of the prisoners.

Philippines.—30th: A serious cholera epidemic spread throughout the island of Luzon.

Russia.—5th: A new commercial agreement was concluded between Russia and Serbia. The Marquis de Montebello resigned the post of French Ambassador at St. Petersburg.—12th: The retirement of Baron de Stael, Ambassador to Great Britain was announced.—15th: The Tsar arrived at Kursk for the manoeuvres.—17th: The ninth Congress of the International Union of Criminalists was opened at St. Petersburg.—19th: The Shah left Kursk for Persia.

Spain.—8th: The King laid the first stone of the new harbour works at Bilbao. Labour disturbances occurred at Barcelona.

Sweden.—28th: The *Fram*, with the Sverdrup exhibition on board, arrived at Christiania.

Turkey.—2nd: An Irade was issued abolishing restrictions on Armenians. A concession for a railway and port in Palestine was granted to a German syndicate.—8th: Fresh difficulties arose between the Porte and the French Quays Company in Constantinople.—10th: A Commission deputed to make reforms in Macedonia left Constantinople for Saloniki. Russia demanded the passage of four torpedo boats through the Dardanelles.—20th: The Russian torpedo boats were allowed to pass through the Dardanelles.—28th: The Ambassadors nominated Muzaffir Pasha as Governor of the Lebanon, to which no objection was raised by Tewfik Pasha, and the protocol was signed.

Turkestan.—25th: Reports were received of a severe earthquake in Kashgar, Eastern Turkestan.

United States.—1st: M. Jusserand, French Minister at Copenhagen, was appointed French Ambassador at Washington, in the place of M. Cambon.—3rd: President Roosevelt narrowly escaped in a motor car accident.—5th: Sir M. H. Herbert was appointed British Ambassador at Washington.—9th: Mr. Hill, Republican, was elected Governor of the State of Maine.—19th: Mr. Charles F. Murphy was elected President of Tammany Hall.—26th: President Roosevelt's condition was pronounced to be satisfactory. The death of Mr. A. R. Shepherd, formerly Governor of Columbia, was announced.

Venezuela.—9th: Mr. Bax Ironside was appointed British Minister Resident at Caracas.—12th: The revolutionary army defeated the Government troops at Tinaquillo.—13th: The revolutionists occupied Chico, and marched on La Guayra. The Government offered an amnesty to the rebels. General Castro retreated from Ocumare.

FORTHCOMING EVENTS.

UNITED KINGDOM.

Bristol.—The MUSICAL FESTIVAL will be held from the 8th to 11th inst.

Cardiff.—The MUSICAL FESTIVAL will be held from the 8th to 11th inst.

Edinburgh.—On the 14th inst. the Poet Laureate will deliver the annual inaugural address at the Edinburgh Philosophical Institution.

Liverpool.—On the 7th inst. Sir Wilfrid Laurier will open the new Produce Exchange of the Liverpool Provision Trade Association.

London.—The annual show of the BRITISH DAIRY FARMERS' ASSOCIATION will be held at Islington, October 7th to 10th.—On the 15th the Lord Mayor will entertain at dinner at the Mansion-house the Premier and many other members of the Government.—On the 16th inst. PARLIAMENT will meet.

Manchester.—On the 15th Mr. Balfour will open the new SCHOOL OF TECHNOLOGY.

Northampton.—The CHURCH CONGRESS will meet on the 7th inst. (four days).

Norwich.—The MUSICAL FESTIVAL will take place, October 21st to 24th.

Portsmouth.—On the 23rd Lord Roberts will receive a sword of honour from the citizens of Portsmouth.

Sheffield.—On the 1st the Sheffield MUSICAL FESTIVAL opens (three days).

COLONIES.

South Africa.—A BRITISH COLONIAL and INDUSTRIAL EXHIBITION of all classes of goods, is to be held in Cape Town from November, 1903, to February, 1904.

FOREIGN COUNTRIES.

Greece.—The opening of the exhibition which it was proposed to hold in Athens this month has been postponed until March 15 next.

Peru.—Mr. Edward Higginson, Consul for Peru at Southampton, has informed the Press Association that his Government has thought convenient to postpone the inauguration of the INTERNATIONAL EXHIBITION OF INDUSTRIAL APPLIANCES OF ALCOHOL until January 1, 1903, in order to give ample time to British manufacturers to exhibit their goods at Lima.

Russia.—AN INTERNATIONAL EXHIBITION OF PHOTOGRAPHY will be held in Moscow in the spring of 1903 under the patronage of H.H. the Grand Duke Michael. The exhibition will be divided into six sections, as follows:—1. Scientific photography; 2. Artistic photography; 3. Photography applied to printing; 4. Works on photography; 5. Technical applications of photography; 6. Photography considered as a special industry. Particulars may be obtained from the Photographic Society, 64, Fomanka, St. Petersburg.

NAVAL AND MILITARY INTELLIGENCE.

NAVAL.

Rear-Admiral R. W. Craigie, the new Admiral-Superintendent of Chatham Dockyard, hoisted his flag on the *Pembroke*, at Chatham, on the 1st ult.

Consequent on the retirement of Vice-Admiral R. M. Lloyd, C.B., Rear-Admiral Sir L. A. Beaumont, K.C.M.G., has been promoted to Vice-Admiral.

The *Royal Oak*, battleship, left Portsmouth on the 13th ult. for Chatham, where she is to have a refit, including the provision of casemates for her upper deck 6-inch guns.

The *Isis*, cruiser, Captain G. H. B. Mundy, was commissioned at Chatham, on the 24th ult., with a complement of 321 officers and men.

The *Hawke*, cruiser, Captain Julian C. A. Wilkinson, arrived at Chatham on the 16th ult. with the relieved crews of the *Vulcan*, *Boxer*, *Bruiser* and *Foam*, from the Mediterranean Station.

The *Crescent*, cruiser, Captain H. H. Campbell, is ordered to be paid off at Portsmouth, on October 3, into the C. Division of the Fleet Reserve. She will afterwards undergo a complete overhaul.

The *Medea*, cruiser, will be commissioned at Jarrow-on-Tyne, on October 8, for service in the Cruiser Squadron. Before

joining the squadron the *Medea* will undergo trials under the supervision of the Parliamentary Boiler Committee.

The *Renown*, battleship, Captain Arthur M. Farquhar, has been selected to convey the Duke of Connaught, after the manoeuvres in the Mediterranean, to India, where his Royal Highness will attend the Delhi Durbar.

The *Cornwall*, cruiser, which is to be almost identical with the *Essex*, being 440 ft. long, of 9,800 tons displacement, and with engines of 22,000 horse-power, developing a speed of 23 knots, will be launched at Pembroke Dockyard on October 29.

The *Venerable*, first-class battleship, is to be commissioned at Chatham on October 21 for service in the Mediterranean. It was first intended that she should relieve the *Magnificent* in the Channel Squadron, but this arrangement has now been altered.

The *Donegal*, first-class armoured cruiser, 440 ft. long, 66 ft. 2 ins. wide, and 24 ft. 6 ins. deep, of 9,800 tons displacement and 22,000 indicated horse-power, was launched on the 4th ult. from the yard of the Fairfield Shipbuilding and Engineering Company at Govan.

The *Calypto*, cruiser, was commissioned at Devonport, on the 3rd ult., with a complement of 150 officers and men as drill ship for the Newfoundland Royal Naval Reserve. She will go under her own steam to Placentia Bay. On arrival there her engines and boilers will be removed and the vessel be housed in.

Rear-Admiral R. F. H. Henderson, on taking over the duties on the 1st ult., of Admiral-Superintendent of Portsmouth Dockyard, hoisted his flag on the *Narcissus*, cruiser, Captain E. G. Shortland, and saluted the flag of Admiral Sir C. F. Hotham, Commander-in-Chief. At sunset, Rear Admiral Pelham Aldrich, the outgoing Admiral-Superintendent, struck his flag on the *Asia*, Captain W. Wilson.

Messrs. John I. Thornycroft and Co. have launched from their works at Chiswick, a first-class torpedo-boat which will be known as No. 110. This vessel is the second of the five torpedo-boats ordered from this firm at the latter end of last year. The length is 166 ft.; breadth, 17 ft. 3 ins.; speed 25 knots, carrying a load of 42 tons. The engines are to be four-cylinder triple compound, and the boilers are of the Thornycroft-Sehulz type.

The *Montagu*, battleship, completed her 30 hours' trial at four-fifths of her power on the 6th ult. The trial was perfectly satisfactory, the mean results being as follows:—Steam in boilers, 262 lb.; vacuum—starboard, 26.3 ins.; port, 25.7 ins.; revolutions—starboard, 112.5; port, 109.1; i.h.p.—starboard, 6,885; port, 6,767. The mean speed of four runs on the measured course off the Cornish coast was 17.8 knots, and the coal consumption 178 lb. per i.h.p. per hour.

The *Niger*, torpedo-gunboat, completed her 30 hours' coal consumption trial on the 6th ult., which was run at one-fifth the maximum power of her machinery, the particulars being reported as follows:—Draught of water—forward, 8 ft. 9 ins.; aft, 10 ft. 4.5 ins.; air pressure, 3 ins.; pressure of steam at boilers, 216 lb.; ditto, at engines, 205 lb.; vacuum—starboard, 26.3 ins.; port, 26.7 ins.; revolutions—starboard, 229 per minute; port, 232; mean pressure in cylinders—starboard, high, 31.7, intermediate, 15.9, low, 6.3; port, high, 30.1, intermediate, 15.7, low, 6.1; i.h.p.—starboard, high, 187, intermediate, 227, low, 218—total 632; port, high, 180, intermediate, 230, low, 216—total 626; total i.h.p., starboard and port, 1,258; coal consumption, 171 lb. per i.h.p. per hour; speed, 14.493 knots. The trial was successful in every respect. In the progressive speed trials of the *Niger*, which were made over the measured mile off the Maplin Sands at various speeds, the mean highest speed recorded taken for four runs with and against the tide, was 20.7 knots. The mean indicated horse-power for this speed was 6,271, and the mean revolutions of the engines 377.5 per minute.

The armoured cruiser *King Alfred*, on her full-power trial at Portsmouth, on the 2nd ult., proved herself the fastest ship in the British Navy, excluding, of course, torpedo-boat craft. The mean of mean speeds on several runs over the Admiralty deep-sea course at Chesil Beach was 23.465 knots. The speeds of the other three vessels of the same class, it may be noted, were:—*Leviathan*, 23.23; and of both *Drake* and *Good Hope*, 23.05 knots. As to coal consumption, this new ship, by Vickers, Sons and Maxim (Limited), has also done well, for after establishing the fact that she could steam from Portsmouth to Melbourne at 15 knots without recoaling, she ran her full-power eight hours' trial on a coal consumption of 1.81 lb. per unit of power per hour. The coal consumption of the *Good Hope* was 1.92 lb., of the *Leviathan* 1.94 lb., and of the *Drake* 1.83 lb. The trial of the *King Alfred* was in every respect satisfactory. At the close of the eight hours' steaming at full power it was found that the mean steam pressure in the boilers had been 283 lb., while the vacuum at starboard engine was 26.6 ins. and at the port engine 25.5 ins. The starboard engine, running at 118 revolutions, developed 15,170 horse-power, and the port engine, making 119.6 revolutions, indicated 15,723 horse-power, the collective power being 30,893 indicated horse-power. The water expended during the trial was only 39 tons, so that altogether the results are very favourable. At the close of the eight hours' test, starting, reversing, and other engine trials, took place, as well as steering tests, all with good results. The draught forward and aft, was 26 ft. 1 in.

France.—The armoured cruiser *Kleber*, which was launched at Bordeaux on the 20th ult., with all her engines, boilers, artillery, and masts on board, has a displacement of 7,735 tons. She has three independent screws, and the contract speed is 21 knots. The vessel is to carry 26 quick-firing guns.

The Cherbourg correspondent of the *Temps* says:—"The combined manoeuvres between the coastguard ships and the submarines which took place yesterday seem to have resulted in favour of the submarines. The theme of the operations was that the ironclads should force the blockade of Cherbourg established by the submarines. The latter, therefore, acted on the defensive, tactics which seem to suit them best. Thus the submarine *Espadon* succeeded twice in torpedoing the *Valmy* and the *Jemappes*. The latter was also torpedoed by the *Triton*, who also succeeded in hitting the *Valmy*. Finally the *Algerien* torpedoed the *Bouvine*. The operations took place in a high sea and during rainy weather. The submarines throughout the manoeuvre were submerged, and their crews were consequently unable to take their midday meal in the open air, as had been arranged. The result of yesterday's naval manoeuvres, therefore, amply confirms all that has been said concerning the submarine, namely, that it becomes really dangerous when acting on the defensive. A hostile naval force will thus only under exceptional circumstances be able to force a blockade established by a submarine flotilla."

Russia.—The Nevsky shipbuilding yard has just turned out a torpedo-destroyer for the Russian navy. The new destroyer is the *Bystry*, and its displacement is 350 tons. In her official trial trips, consisting of four runs, with a forced draught, the *Bystry* attained a speed of 27.96 knots when making the last two runs, and the average rate of speed came out at 27.1 knots. The destroyer built by the Creighton yard on the Neva, and the *Sokol* type, is the *Stremitelny*; at its recent official trips this boat attained, with a forced draught, an average speed of 26.19 knots.

Sweden.—The recent steam trials of the torpedo-boat-destroyer *Mode*, which has been constructed by Messrs. Yarrow for the Swedish Government, have been eminently successful. This vessel is fitted with four Yarrow water-tube boilers and two

sets of four-cylinder triple-expansion inverted engines, whose rotating and reciprocating parts are balanced on the Yarrow-Schlick-Tweedy system, and the entire absence of vibration either in the engines themselves or in the hull of the vessel, when working at all powers up to the maximum of 6,500 horses, affords complete proof of the advantages gained by adopting this system of balancing. The mean speed obtained from an average of six runs over the measured mile was found to be 32.13 knots per hour, the contract full speed being 31 knots per hour. The armament of the *Mode* consists of two revolving 18-inch torpedo tubes capable of discharging in any direction, six 57-millimetre quick-firing guns situated one on each bow, one on the conning tower, two amidships, and one aft; and she has also a searchlight fitted on the top of her chart-house.

The official trial has been completed of the coast defence vessel *Aran*, built for the Swedish navy. She is 3,700 tons, 6,500 horse-power, and furnished with eight Yarrow watertube boilers. The mean speed exceeded the contract speed by six-tenths of a knot, amounting to 17.4 knots, and the horse-power exceeded the contract power by 1,000 horse-power. The coal consumption, including the steam for the auxiliary engines, amounted to 178 lb. per horse-power per hour.

Turkey.—The Turkish Government is organising its navy, and has given orders for the construction of two cruisers by contract, to be named the *Abdul Hamid* and the *Abdul Medjid*. These are to be 328 feet long, 42.5 feet beam, with a mean draught of 16 feet, and a tonnage displacement of 3,250. They are each to be fitted with engines of 12,000 horse-power, and to be capable of steaming 24 knots per hour. The old ironclad *Messudieh*, which was built at Blackwall in 1874, has also lately undergone re-construction by Ansaldo and Co. at Genoa. She was originally of 9,120 tons displacement, 332 feet long, 59 feet beam, and 26 feet draught, and had a speed of 13 knots per hour, with engines of 7,800 horse-power. Since her re-construction, which has involved the fitting of barbettes for heavy guns, and water-tube boilers with twin-screw engines, she has undergone a steam trial, developing a horse-power of 9,050. Her speed, with the new engines developing their full horse-power of 11,000, is expected to be 17.5 knots per hour.

United States.—A Laffan telegram, dated New York, September 6, states that Lieut. Winchell, of the United States navy, has reported to the Navy Department the results of a trial voyage with the steamer *Mariposa*, burning oil fuel, from San Francisco to Tahiti. About 278 barrels of oil were consumed daily, and an average of 2,481 horse-power developed. The fuel consumption was practically 50 per cent. less weight than the coal necessary for the same voyage. The flame did not affect any part of the boilers, and the engine-room force was reduced from 36 to 20 men.

MILITARY.

H.R.H. the Duke of Connaught has been appointed Colonel of the Army Service Corps.

Lieut.-Colonel S. A. E. Hickson, D.S.O., has been appointed Commanding Royal Engineer at Shorncliffe.

Lieut.-Colonel G. M. Bullock, C.B., has been appointed to succeed the late Colonel Forestier-Walker as Deputy-Adjutant-General in Egypt.

Major R. A. K. Montgomery has been appointed to the Staff of the First Army Corps at Aldershot, as Deputy Assistant Quartermaster-General.

Lieut.-Colonel C. J. Mackenzie, C.B., Seaforth Highlanders, has been appointed Assistant-Quartermaster-General of the South-Eastern District.

Colonel Sir W. G. Knox, K.C.B., has been appointed a Major-General on the Staff to command the Royal Artillery of the Second Army Corps.

Major C. R. H. Hardy, Cheshire Regiment, has been appointed to succeed Lieut.-Colonel F. W. Bromfield, in command of the 1st Battalion.

Lieut.-Colonel Walsh, Somersetshire Light Infantry, has been appointed to the command of the 20th Regimental District, vice Colonel Brunner-Rundell retired.

Lieut.-General Sir John French took over the command of the First Army Corps at Aldershot, on his return from the German manoeuvres on the 15th ult.

Captain G. S. Mansfield, Royal Army Medical Corps, who was till recently serving at Aldershot, has been posted to the Home District for duty with the Grenadier Guards.

Lieut.-General Lord William Seymour has been appointed Lieutenant of the Tower of London in the room of General Sir William Stirling, who has vacated the appointment.

Colonel R. H. Murray, C.B., now temporarily Major-General in command of a brigade at Aldershot, has been appointed to the vacant command of the garrison of Alexandria.

Colonel Allin, Royal Army Medical Corps, who formerly commanded the depot and training school at Aldershot, has been appointed Principal Medical Officer in Cape Colony.

Brevet Lieut.-Colonel M'D. Elliot, R.E., has been selected to proceed to West Africa in connection with the Anglo-French Boundary Commission.

Colonel Metcalfe, commanding the 2nd Rifle Brigade, has been appointed Colonel on the Staff to command the troops in Mauritius.

Colonel C. St. L. Barter, C.B., lately commanding the 2nd King's Own Yorkshire L.I., has been appointed Assistant-Adjutant-General in the Thames District, vice Colonel W. T. Dooner.

Brevet Lieut.-Colonel J. T. Sterling has been appointed Commandant and Lieut. G. C. Hamilton, Grenadier Guards, Adjutant of the School of Instruction, at Chelsea Barracks from October 1.

Colonel J. M. Grierson, C.B., Assistant Quartermaster-General, Second Army Corps, has been appointed a Brigadier-General on the Staff and Chief of the Staff of the Second Army Corps, at Salisbury.

Colonel J. S. S. Barker, R.A., has been appointed Assistant-Adjutant-General at Devonport, in succession to Colonel W. S. Clarke, transferred to the Command of the 29th Regimental District Depot at Worcester.

Colonel W. E. Webb, Royal Army Medical Corps, now Assistant Professor of Clinical and Military Medicine at the Army Medical School, Netley, has been appointed Principal Medical Officer at Hong Kong.

Colonel H. T. S. Yates, Colonel on the Staff commanding the Royal Artillery, has assumed command of the Woolwich District, vice Major-General Sir F. Maurice, K.C.B., whose extended period of command has expired.

Colonel W. Pitt, who has been for about 18 months acting as Commanding Royal Engineer of the First Army Corps at Aldershot, has been appointed Commanding Royal Engineer of the Home (London) District, succeeding Colonel S. Waller.

Captain R. W. Hare, D.S.O., Norfolk Regiment, who has been serving with the Rhodesian Protectorate Regiment and on the Staff in South Africa, has been appointed Aide-de-Camp to the Lieutenant-Governor of the Orange River Colony.

Brevet-Colonel C. T. E. Metcalfe, whose four years in command of the 2nd Battalion Rifle Brigade at the Cape expires shortly, will not bring his battalion to Egypt, as he has been selected for the command of the troops in Mauritius. Colonel Metcalfe commanded his battalion throughout the siege and defence of Ladysmith, and particularly distinguished himself in the capture and destruction of a 4.7 in. howitzer which the Boers had mounted on Surprise Hill.

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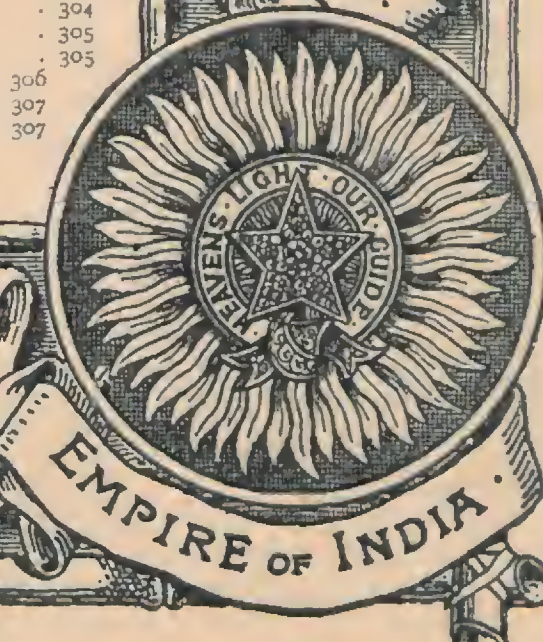
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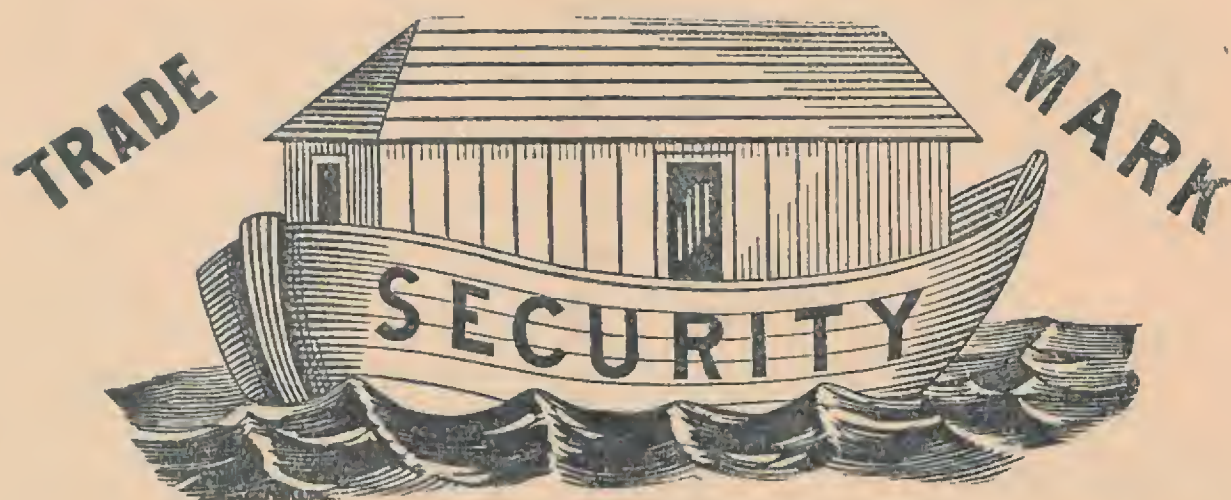
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(West Central Lower Gallery.)

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Representative Governors.—Mr. THOMAS E. FULLER (Agent-General).
[ONE VACANCY.]

Corresponding Agent in Colony.—(At present through the Agent-General's Office.

Curator of Collection.—Mr. LEWIS ATKINSON.

Products Exhibited.—Agricultural produce, building stones, coal dried fruits, furs, minerals (including asbestos, gold-bearing quartz, copper ores, diamondiferous gravel, etc.), stuffed ostriches, ostrich eggs and feathers, Angora hair, tobacco, wines, wools, etc.

NATAL.

(West Central Lower Gallery.)

Representative Governor.—SIR WALTER PEACE, K.C.M.G.

Corresponding Agent in Colony.—Mr. C. B. LLOYD, Commissioner of Agriculture and Mines, Natal.

Curator of Collection.—(In charge of Institute Staff.)

Products Exhibited.—Agricultural produce, Angora hair, tanning barks, building stones, coffee, cutlery, indigenous timbers, minerals, coal, silk cocoons, spirits, sugar, tea, tobaccos, wine, wools, native ornaments, etc., etc.

RHODESIA AND BECHUANALAND.

(West Central Lower Gallery.)

Representative Governors.—Those of CAPE COLONY.

Curator of Collection.—Mr. LEWIS ATKINSON.

Products Exhibited.—Specimens of native workmanship kindly lent by the late

[Queen Victoria.

NYASALAND, BRITISH CENTRAL AFRICA.

(West Central Lower Gallery.)

Products Exhibited.—(By the British Central Africa Chamber of Agriculture and Commerce).—Coffee, ivory, *Landolphia* rubber, chillies, *Strophanthus* seeds, beeswax, photographs, etc.

BRITISH AMERICA.

(West and Upper West Central Galleries.)

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[ONE VACANCY.]

Corresponding Agent in Province.—The COMMISSIONER OF AGRICULTURE.

Products Exhibited.—Canadian furs from Hudson's Bay Co., stuffed birds, wood pulp, slates, vehicles, minerals (asbestos, apatite, mica, plumbago, etc.), agricultural produce, fruits, tobacco, maple sugar, timber, Indian ornamental work, cotton, linen, and leather, and iron manufactures.

THE COMMERCIAL COLLECTIONS OF THE INSTITUTE—*continued.*BRITISH AMERICA—*continued.*DOMINION OF CANADA—*continued.*

PROVINCE OF ONTARIO.

Representative Governors.—SIR HENRY TYLER and JOHN PATON, Esq.

Corresponding Agent in Province.—Mr. ARCHIBALD BLUE, Director of Mines, Toronto.

Products Exhibited.—Agricultural produce, preserved fruits, indigenous timbers, gold, silver, iron, lead, and nickel ores, petroleum, marble, granite and decorative stones, coal, native wines, honey, canned meats, and woodwork.

PROVINCE OF BRITISH COLUMBIA.

Representative Governor.—The Hon. J. H. TURNER (Agent-General).

Corresponding Agent in Province.—(At present through Agent-General's Office.)

Products Exhibited.—Agricultural produce, coal, Douglas fir and other timbers, minerals, preserved fruit, tinned salmon, fish oils, woodwork, birds, and animals.

PROVINCE OF NEW BRUNSWICK.

Representative Governor.—C. A. DUFF MILLER, Esq., Agent-General.

Corresponding Agent in the Province.—The PROVINCIAL SECRETARY.

Products Exhibited.—Timbers, minerals, building stones.

PROVINCE OF MANITOBA.

Representative Governor.—The Rt. Hon. the LORD STRATHCONA and MOUNT-ROYAL, G.C.M.G.

Corresponding Agent in Province.—The PROVINCIAL SECRETARY.

Products Exhibited.—Agricultural produce (including barley, beans, corn, oats, peas, rye, wheat, flour, &c.); birds, comprising ducks, grouse, partridges, snipe, etc.; heads of wapiti, caribou, moose and other large game; specimens of native workmanship, photographs, head-dresses, clubs, arrows, beadwork, etc., etc.

PROVINCE OF NOVA SCOTIA.

Representative Governor.—JOHN HOWARD, Esq., Agent-General.

Corresponding Agent in Province.—(At present through Agent-General's Office.)

Products Exhibited.—Minerals, samples of iron ore and products manufactured from the ore, wood-wool.

NORTH-WEST TERRITORIES.

Representative Governor.—THOMAS SKINNER, Esq.

Corresponding Agent in Province.—(At present through the Representative Governor.)

Products Exhibited.—Grain.

NEWFOUNDLAND.

(Upper West Central Gallery.)

Representative Governor.—[VACANT.]

Corresponding Agent.—

Products Exhibited.—Minerals (including ores of iron, copper, manganese, chromium, lead, antimony and zinc, molybdenite, mispickel, mica, asbestos, steatite, granite, marble, slate, coal, and petroleum) and timber.

BERMUDA.

(Middle of Central Lower Gallery.)

Representative Governor.—Gen. SIR ROBERT BIDDULPH, G.C.B., G.C.M.G.

Corresponding Agent.—THE COLONIAL SECRETARY.

Products Exhibited.—Arrowroot, woods, silk, shell-work, and sandstone.

WEST INDIES.

(West Central Lower Gallery.)

BRITISH GUIANA, TRINIDAD, AND TOBAGO.

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Curator of Collection.—(In charge of Institute Staff.)

Products Exhibited.—Arrowroot, cereals and pulses, medicinal barks, cocoa, coral, coffee, indigenous timbers, lace, fibres, rum, spices, starches, sugars, timber, leather, skins, drugs, fish glue, basket-work, condiments, etc.

JAMAICA AND BAHAMAS, WINDWARD ISLANDS, AND BARBADOS.

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Products Exhibited.—Arrowroot, barks, cocoa, coral, coffee, indigenous timbers, lace-bark, fibres, rum, spices, starches, sugars, sarsaparilla, wax, oils, condiments, turtle, etc.

BRITISH HONDURAS.

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Products Exhibited.—Banana and cassava meal, cocoanut oil, coffee, horns (deer), indiarubber, Indian corn, medicinal barks, pickles, preserved fruits, rice, rope and cordage of native manufacture, rum, seeds edible and ornamental, spices, sponges, sugar, mahogany and other timbers, tobacco, etc.

LEEWARD ISLANDS.

Representative Governor.—[VACANT.]

Corresponding Agents.—Grenada: THE COLONIAL SECRETARY.

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St. Lucia: MR. T. H. DIX.

Products Exhibited.—Arrowroot, barks, cocoa, coral, coffee, indigenous timbers, fibres, rum, spices, starches, sugars, etc., etc.

FALKLAND ISLANDS. (Middle of Central Lower Gallery.)

Representative Governor.—Gen. SIR ROBERT BIDDULPH, G.C.B., G.C.M.G.

Corresponding Agent.—THE COLONIAL SECRETARY.

Products Exhibited.—Wool, birds' skins and eggs.

BRITISH AUSTRALASIA.

NEW SOUTH WALES.

(East Central Upper and Lower Galleries.)

Representative Governor.—The Hon. HENRY COPELAND (Agent-General).

Corresponding Agent in Colony.—(At present through Agent-General's Office.)

Products Exhibited.—Minerals (including gold, silver, coal, &c.), wool, indigenous timbers, wines, cereals, seeds, gums, resins, oils, fibres, rope, leather, tallow, etc., etc.

VICTORIA.

(East Central Upper and Lower Galleries.)

Representative Governors.—[VACANT.]

Corresponding Agents in Colony.—(At present through Agent-General's Office.)

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Products Exhibited.—Animals, birds, coal, cereals, chemical manufactures, cigars, essential oils, gums, grain, hops, indigenous timbers, leather, leatherware, minerals (including auriferous quartz, coal, kaolin, etc.), models of gold nuggets, seeds, sugar, tobacco, wines, wool, etc., etc.

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Products Exhibited.—Agricultural produce, wines, indigenous timbers, furniture, wool, etc.

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Products Exhibited.—Building stones, eucalyptus oils, fibres, minerals, pearl shells, indigenous woods, cereals, models of fruits, sugar, wine, tinned meats, hides, skins, leather, etc., etc.

WESTERN AUSTRALIA. (East Central Lower Gallery.)

Representative Governor.—The Hon. H. B. LEFROY (Agent-General).

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Curator of Collection.—(In charge of Institute Staff.)

Products Exhibited.—Wools, gums and resins, olive oil, fibrous barks, silk, skins, indigenous woods, minerals, model gold ingots, etc., etc.

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Products Exhibited.—Cereals, minerals, models of fruits, stuffed fish, furs, timbers, illustrations of local manufactures, etc., etc.

NEW ZEALAND. (East Central Lower Gallery.)

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Curator of Collection.—(In temporary charge of Institute Staff.)

Products Exhibited.—Agricultural produce, building stones, coal, Kauri gum, hemp and flax, tinned meats, wools, tobacco, Kauri and other woods, with illustrations of their application to structural and ornamental purposes; photographs, etc., etc.

FIJI. (Middle of Central Lower Gallery.)

Representative Governor.—Gen. SIR ROBERT BIDDULPH, G.C.B., G.C.M.G.

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Curator of Collection.—(In charge of Institute Staff.)

Products Exhibited.—Barks, fibres, copra, tea, cocoa, coffee, timbers, etc.

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Products Exhibited.—Fodder grasses, foods and food stuffs, sugar, spices and condiments, models of fruits, narcotics (including opium, ganja, etc.), tobacco and cigars, tea and coffee, oils and oil-seeds (including those of castor, sesamum, linseed, cocoa-nut and ground nut, etc.), a large assortment of drugs, dyes and tans, gums and resins (including the resins and turpentine of Indian pines, wax, lac, etc.), an extensive collection of fibres (including cotton, silk, jute, coir, reha, agave, etc.), models illustrating the manufacture of cotton and jute, minerals (including building stones, coal, mica, soapstone, corundum, iron ores, steel, etc.), timbers, collection of Indian pottery, carved woodwork, silver, brass and copper ware, silk and cotton fabrics.

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(East Gallery.)

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Products Exhibited.—Barks, canes, drugs, fibres, preserved fruits (including Singapore pine-apples), mats, silk fabrics, oils and oil-seeds, dyes and tans, gums, gutta-percha, tin ores and other minerals, teas, coffee, spices, timbers, etc., etc.

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(West Central Lower Gallery.)

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Curator of Collection.—(In charge of Institute Staff.)

Products Exhibited.—Fibres, hemp, oils, rum, seeds, sugars, tortoise-shell, vanilla beans, with specimens of native workmanship, etc., etc.

HONG KONG. (Middle of Central Lower Gallery.)

Representative Governor.—SIR WILLIAM ROBINSON, G.C.M.G.

Corresponding Agent in Colony.—The HARBOUR MASTER.

Curator of Collection.—(In charge of Institute Staff.)

Products Exhibited.—China, carved and inlaid ivory and wood-work, silver and lacquer ware, silk and cotton fabrics, drugs, paints, dyes, food stuffs, etc., etc.

BRITISH NORTH BORNEO. (West Central Lower Gallery.)

Corresponding Agent.—(At present through the British North Borneo Co.)

Curator of Collections.—(In charge of Institute Staff.)

Products Exhibited.—Timbers, rattans, coal, rice, sago, sugarcane and raw sugar coffee, cocoa pods, pepper, tobacco, beeswax, camphor, gutta-percha, kapok fibre dammars, cutch and gambier, hemp, honey, etc.

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(West Central Gallery.)

Representative Governor.—Gen. SIR ROBERT BIDDULPH, G.C.B., G.C.M.G.

Corresponding Agent.—(At present through the Representative Governor.)

Curator of Collections.—(In charge of Institute Staff.)

Products Exhibited.—From Malta—Carved stone-work, lace, macaroni, honey, various fabrics, models, pictures, etc., etc. Gibraltar and Cyprus—None at present.

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GENERAL NOTICES.

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TO

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After the 1st of January, 1903—when the Act comes into operation—subscribing Fellows will cease to exist as such.

It is suggested that any standing orders that may have been given to Bankers or Agents for the payment of the annual Fellow's subscription should be cancelled. A continuance of the enjoyment of privileges of Fellowship will be secured to those now on the Roll of Life Fellows of the Institute, but no new Life Fellows will be elected.

SPECIAL EXHIBITION OF COLONIAL PRODUCTS AND INDUSTRIES.

A Special Exhibition of Collections illustrative of the Mineral Wealth and of certain Industries of the DOMINION OF CANADA, also of commercial products from QUEENSLAND, RHODESIA, WESTERN AUSTRALIA, and BRITISH NORTH BORNEO, is on view in the western half of the North Gallery, from 11 a.m. to 4 p.m., on week-days—Admission Free.

FELLOWS' DEPARTMENT.

The Reading, Writing, and News Rooms, are open for the use of Fellows every week-day from 10 a.m. till 11.30 p.m., and on Sundays from 3 p.m. to 10.30 p.m. The Library (on the First Floor), is open from 10 a.m. to dusk on Week-days, and from 3 p.m. to dusk on Sundays. The Map Room (First Floor) is open from 10 a.m. to 5 p.m. on Week-days.

The Poste Restante is open every week-day for receipt and delivery of letters and parcels. Letters addressed to initials only are not received, except in reply to notices in the JOURNAL, under "Requirements" Registry. The General Post Office Pillar Box is cleared daily twelve times, between 10.10 a.m. and midnight. Light refreshments only are provided in the Fellows' Rooms and at the bar of the Ceylon Kiosk.

EMIGRATION INFORMATION OFFICE.

The Office of the British Women's Emigration Association (see page 302), in the West Corridor, First Floor, is open daily from 10 a.m. to 4 p.m., and advice and information respecting emigration and openings in the Colonies may be obtained there free of charge. Enquiries of all kinds relating to the Colonies from intending Emigrants are dealt with in the Commercial Intelligence Department, and special information respecting Canada and the Cape Colony may also be obtained from the Curators for these Colonies, on application personally at their offices, or by letter.

"REQUIREMENTS" REGISTRY.

With the object of affording Fellows of the Imperial Institute, and the General Public resident in the United Kingdom, an opportunity of making known special "wants" or "needs" in the British Colonies, India, and Foreign Countries, space will be regularly devoted to approved notices in a column reserved for this purpose. Advertisers may have their replies addressed to them direct, c/o the Imperial Institute, London, S.W., under a distinctive number and initials. The cost of postage will be charged for the transmission of replies delivered at the Institute. Residents in the Colonies and India, and Foreign Countries, can register in like manner. (For further particulars see page 297).

SCIENTIFIC AND TECHNICAL DEPARTMENT.

The Scientific and Technical Department of the Institute has been established to acquire information by special enquiries and by experimental research, technical trials and commercial valuation regarding new or little known natural or manufactured products of the various Colonies and Dependencies of the British Empire and of foreign countries, and also regarding known products procurable from new sources, and local products of manufacture which it is desired to export. This work is carried out with a view to the creation of new openings in trade, or the promotion of industrial developments.

In the extensive and well-equipped series of Research Laboratories occupying the West Corridor of the Second Floor, a staff of skilled Chemists, under the direction of Professor Wyndham R. Dunstan, M.A., F.R.S., carry out the investigation of the chemical constitution and properties of new dye-stuffs, tanning materials, seeds and food-stuffs, oils, gums and resins, fibres, timbers, medicinal plants and products; animal products, minerals and ores, soils, cements, and various other products, with a view to their commercial utilization. Whenever necessary these materials are submitted to special scientific experts, by whom they are made the subjects of particular investigation or practical tests. Reports are also obtained from technical or trade-experts in regard to the probable commercial or industrial value of any such products, whilst full information is collected from official or other trustworthy sources regarding the probable extent and cost of available supplies. All materials requiring scientific or technical examination, or commercial valuation, should be submitted to the Institute for examination either by, or through the Foreign Office, the Colonial Office, the India Office, or the Board of Trade, or through the Colonial or Indian Government Authorities. Requests for the examination of such materials may also be submitted by Public Commercial Bodies and Institutions of the respective Colonies and Dependencies, or by the Representatives of H.M. Government in foreign countries.

COMMERCIAL COLLECTIONS.

The Galleries containing the Colonial and Indian Collections, and the Public Commercial and Industrial News Room, are open for free inspection by the public daily, except Sundays, and any days specially notified, from 11 a.m. until 4 p.m. Every information concerning the products, their supply, etc., can be obtained on application to the Curators of the Indian and Ceylon, Canadian, and South African Sections, to the general Curator, and to the Commercial Intelligence Department.

COMMERCIAL INTELLIGENCE DEPARTMENT.

The Office of this Department, in the West Corridor, First Floor, is open daily from 10 a.m. to 5 p.m. (on Saturdays till 1 p.m.), for the purpose of answering enquiries and supplying information relating to the Commerce (Export and Import) and Industries of India and the Colonies. Applications may be made personally or by letter. Special information may be obtained from the Curators in charge of the Indian and of certain Colonial Collections. Arrangements have been made for the translation for mercantile firms of Trade Circulars, Price-Lists, and Catalogues into any Foreign Language, including the conversion of weights, measures and coinages, etc., at cost price, and application for such may be addressed to this Department.

CITY BRANCH OF THE IMPERIAL INSTITUTE.

REMOVAL TO 49, EASTCHEAP, E.C.

The City Enquiry Office and Reading Room have been removed from 112, Cannon-street to larger premises at 49, EASTCHEAP, where a commodious apartment is also provided for the display, to merchants, manufacturers, etc., of raw and manufactured products received, from time to time, from the Colonies and from India, and for which it is desired to find openings in British markets. General commercial information is supplied to enquirers at all times.

A representative for INDIA attends on Monday, Wednesday, and Friday mornings.

A representative for the DOMINION OF CANADA attends daily by appointment.

A representative for QUEENSLAND attends daily from 10 a.m. to 1 p.m.

The Commercial Agent for the NEW SOUTH WALES Government attends daily from 10 a.m. to 5 p.m.

Colonial and Indian newspapers, directories, reports, statistics, and other books of reference may be consulted by the general public. (For further information see page 300).

THE NORTHBROOK SOCIETY.

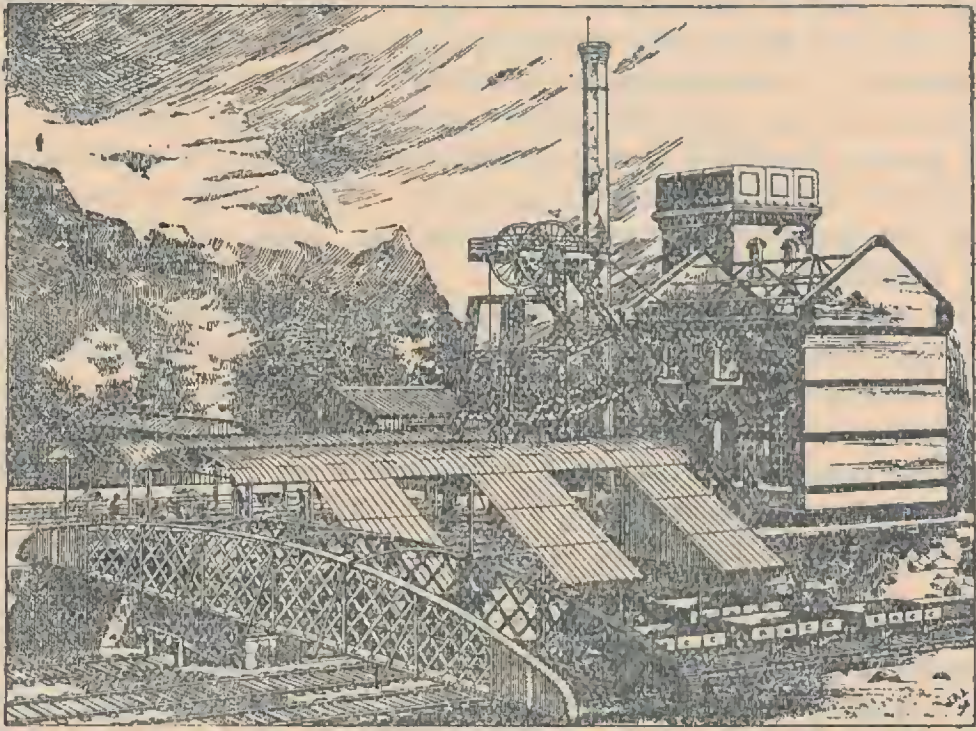
The Northbrook Society is affiliated to the Imperial Institute, and has a special room allotted for the exclusive use of its members in the Institute buildings. Its primary objects are to watch over and promote the interests of natives of India, and to provide a system of guardianship or supervision over such as are sent to Europe for education. The Society is controlled by a committee consisting of an equal number of Governors of the Imperial Institute and members of the Society, presided over by the Earl of Northbrook. It possesses an excellent library. Indian members, who pay no subscription to the Society, have the especial advantage of becoming Fellows of the Institute at half the usual subscription payable by the ordinary Fellows. Applications for membership of the Society should be addressed to the Secretary of the Northbrook Society, Imperial Institute, London, S.W.

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An ornamental red Cloth Cover, for binding the numbers of the JOURNAL for the year 1901 into one volume, may be obtained at the TICKET OFFICE of the INSTITUTE, or from Messrs. WATERLOW AND SONS LIMITED, Blomfield-house, London-wall, E.C., price 2s. 6d. An index and title-page to the volume were inserted in the January issue of the JOURNAL. Bound yearly volumes of the JOURNAL, for the years 1895-1901, may be had at 1cs. each.

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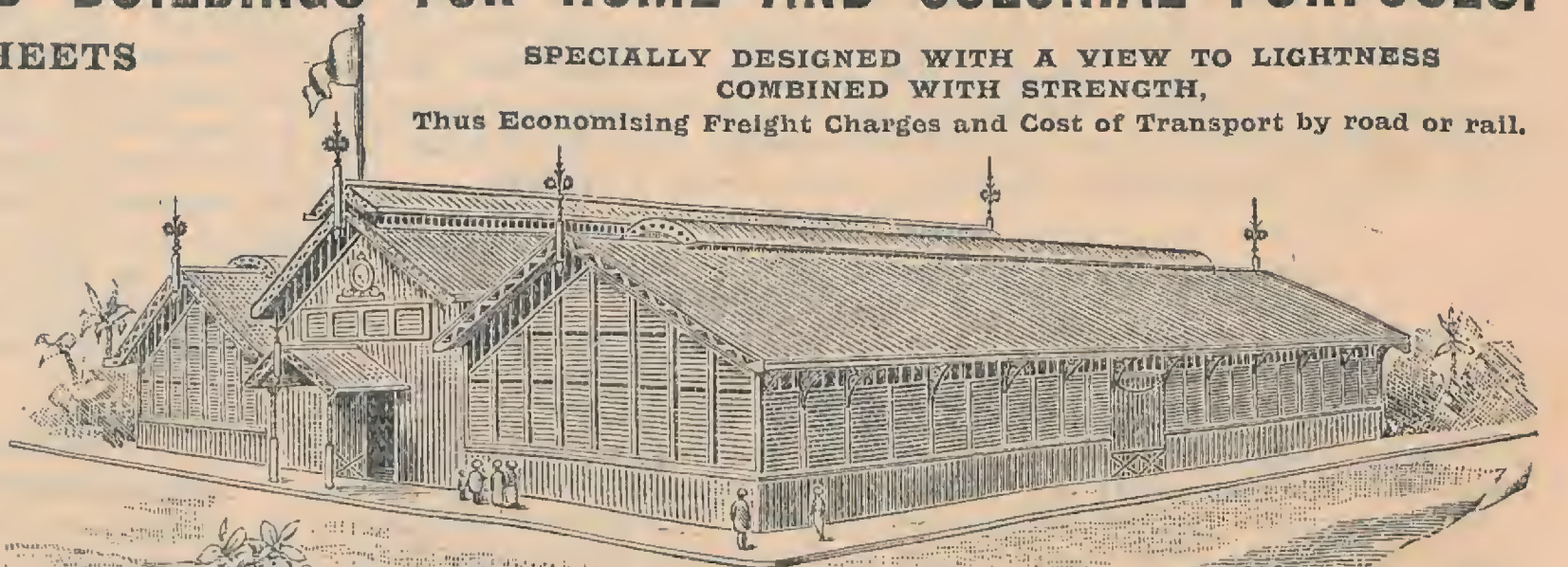
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FINANCIAL AND COMMERCIAL RETROSPECT.

UNITED KINGDOM.—Increased values are shown by the Board of Trade returns for September, both in the imports and the exports, though in making comparisons it must be remembered that the month this year contained one more working day than it did last. In the imports, which were valued at £41,764,491, there was an increase of £3,555,700, or 9·3 per cent. In articles of food and drink, although on the whole there was a considerable increase, decreases were reported in many individual cases—for example, cattle, sheep, bacon, fresh beef, cheese, Indian corn, all showed decreases, both in quantity and value, ranging from 9·3 per cent. to nearly 30 per cent. Preserved meat (not salted), however, increased by 21 per cent., and the quantity of fresh mutton was greater by 52·3 per cent., the increment of value being 58·1 per cent., while butter, worth £1,709,514, showed an increased value of 24·2 per cent. In cereals, heavier shipments from the United States, Russia, India, and Canada brought the quantity of wheat up 7,899,673 cwt.—an increase of 1,880,973 cwt. or 31·2 per cent., the value improving by £696,310 or 36·2 per cent. Wheat flour, oats and barley were all better, the quantity of the last-named increasing by 33·4 per cent. and its value by 30·0 per cent. Indian corn, however, mainly because of smaller arrivals from the United States, fell off by 1,150,135 cwt. (29·8 per cent.) in quantity and by £268,454 (or 26·9 per cent.) in value. Refined sugar improved in quantity and value, but though the quantity of raw sugar was 16·6 per cent. greater, its value was 9·9 per cent. less. In tobacco there was a very large increase, the quantity being greater by 79·9 per cent. and the value by 89·5 per cent. In raw materials for textiles the imports of raw cotton were less by 8·4 per cent., smaller shipments coming from the United States and Egypt, though larger ones from Brazil and India; the value was less by 7·5 per cent. Flax and hemp were also less, but of jute the quantity was better by 93·9 per cent., and the value by 74·4 per cent. Of sheep's wool, Australia and New Zealand sent larger supplies, and the quantity rose by 6,479,517 lb. (or 31·3 per cent.), and the value by £249,000 (or 41·2 per cent.). Hewn and sawn wood was worth £3,092,244, an increase of 31·3 per cent.; its quantity rose by over 200,000 loads (20·2 per cent.). The exports of British and Irish merchandize at £23,809,101 showed an increase of £1,837,799 or 8·3 per cent., almost all classes of articles being better. Raw materials formed an exception, for coal, though the amount sent away was 110,400 tons larger than in September of last year, was £139,891 less in value. In iron and steel there was an increase of nearly £600,000 (27·9 per cent.), the quantity having increased still more (40·1 per cent.). Machinery, too, improved in value to the extent of 14·0 per cent.; new ships sold to foreigners were worth £272,254 more. In yarns and textiles cotton yarn was worth 2·8 per cent. less, though 4·5 per cent. greater in quantity; in cotton piece-goods there was a fall of 4·4 per cent. in quantity and of 3·8 per cent. in value, the shipments to Turkey and China being smaller, though those to Argentina and Brazil increased. Higher values were reported for other cotton manufactures, linen yarn and piece-goods, and woollen and worsted yarns and tissues. Soda-compounds, though 10·7 per cent. greater in quantity, fell off 0·3 per cent. in value, but chemical manures increased 39·8 per cent. in the former respect and 42·8 per cent. in the latter. The re-exports of foreign and colonial merchandize were worth £4,796,675, compared with £4,768,235 in September of last year, the increase thus being £28,440. For the first nine months of the present year the imports had an aggregate value of £388,871,037 against £384,460,711 in the same period of last year; the difference, £4,410,326, represents an increase of 1·1 per cent. The exports were worth £209,513,671 against £209,143,040, thus showing a gain of £370,631 or 0·1 per cent. The re-exports, however, decreased from £50,543,899 in the first nine months of 1901 to £49,348,686 in the same period of the present year, the fall thus being £1,195,213, or 2 per cent.

A Japanese Imperial Government Loan was successfully floated in London during last month by the agency of British and Japanese houses only. The Loan was for 50,000,000 yen, equal to £5,104,166, the yen being taken at the fixed exchange value of 2s. 0½d. The bonds are to bearer in amounts of 1,000 and 5,000 yen each, and bear 5 per cent. interest. The interest was made at par, or £102. 1s. 8d. per bond of 1,000 yen. As to redemption, the bonds are to remain unredeemed for five years from their respective dates of issue; after that period the amount to be redeemed will be settled by the Minister of Finance, but bonds to the value of 25,780,000 yen will be redeemed not later than 1955, and to the value of 24,220,000 yen, not later than 1956. The issue was largely responded to, many of the applications being for small amounts, and applicants received only about 25 per cent. of what they applied for.

COLONIES.—In Western Australia, the revenue for the year ending June 30 last amounted to £3,688,049 or £271,040 more than the estimate. The expenditure was £3,490,025, and after liquidating the deficit of £74,830 from the preceding year, the surplus reported by the Colonial Treasurer in his financial statement was £123,194. The estimates for the current financial year, are—revenue, including the surplus from 1901–2, £4,156,134; expenditure, £4,154,504; surplus, £1,630. This estimated expenditure includes interest, £522,714; sinking fund, £180,572; Malcolm-Laverton Railway, £55,000; Gooseberry Hill Railway, £18,000; and depreciation of Government Stores, £60,000. In the loan accounts, the total authorizations amount to £15,940,929, and £855,620 remains to be raised. Of the total loan expenditure, £7,547,950 has been actually spent

on railways, £1,835,210 on harbours, £2,329,963 on the water-supply, and £784,824 in developing the goldfields.

The report of the Commissioners of the New South Wales Government Railways for the year ending June 30 last, shows that, by the addition of 187 miles of new line, the total mileage in operation at the end of the commercial year was brought up to 3,025 miles, the total capital cost of which in construction and equipment had been 40½ million sterling. The receipts for the year were £3,668,686; this amount is nearly £100,000 greater than in the preceding year. The expenditure increased by £200,000 to £2,267,369, but the net earnings were only £1,401,317, or £129,000 less than in the preceding year. The interest earned on the capital invested was the lowest return obtained during the last six years, and was only 3½ per cent.; hence, as the average interest on the capital employed is calculated at 3·56 per cent., there was a loss on the transaction of £33,000.

The gold output of the Transvaal for September amounted to 170,802 oz. of fine gold. In August the amount was 162,750 oz., and in September of last year 31,936 oz. In September, 1899, just before the war broke out, the yield was 426,556 oz. The Rhodesian return for September was 15,164 oz. In Western Australia, the crushing returns of all the gold-mining companies show that 173,377 tons of ore were treated in September, and that 186,965 oz. of gold were obtained, the average yield per ton thus being 1 oz. 1 dwt. 13 gr. In September of last year, 135,342 tons of ore produced 163,253 oz. of gold, the average per ton being thus 1 oz. 4 dwt. 3 gr.

The following table shows the variations which have occurred in certain Colonial Government securities during the last three months:—

	28th Aug.	29th Sept.	29th Oct.
Canada 3 per cent.	102½–103	102½–102¾	102½–103
Cape 3 per cent.	94½–94¾	92–92½	91½–92
Natal 3 per cent.	96½–97½	95½–96½	95½–96½
New S. Wales 3 per cent.	94½–94¾	91½–92	91½–91¾
New Zealand 3 per cent.	96½–96¾	94½–95	94½–95
Queensland, 3 per cent.	93½–93¾	92–92½	92½–92¾
South Australia 3 per cent.	93½–94½	92½–93½	92½–93½
Tasmania 3½ per cent.	103½–104½	103½–104½	103½–104½
Victoria 3 per cent.	94½–95	93½–94	93½–93¾
West Australia 3 per cent.			
(May–Nov.)	93½–94½	92½–93½	90½–91½

INDIA.—The following table shows the prices of certain leading Indian railway companies at the end of each of the last three months:—

	29th Aug.	30th Sept.	29th Oct.
Bengal and North Western	128–132	128–132	128–132
Bengal-Nagpur Gua. 4 per cent.	102–106	102–106	102–106
Bombay, Baroda & Cent. India	150–155	151–156	146–152
Indian Midland 4 per cent.	103–107	103–107	103–107
Madras Grntd. 5 per cent.	133–137	133–137	133–137
South Indian 4½ per cent. Deb.	137–141	137–141	135–139
Southern Mahratta 3½ per cent.	103–106	104–107	103–107

FOREIGN COUNTRIES.—The French estimates for 1903 put the revenue at 3,575,000,000 fr., and the expenditure at 3,602,000,000 fr., there thus being a deficit of 27,000,000 fr. In preparing his estimates, the Minister of Finance had to face a total deficit of 207,000,000 fr., arising as to 124,000,000 fr. from diminution in the revenue, as to 42,000,000 fr. from increase in expenses, and as to 41,000,000 fr. from the reduction of the sugar duty to 25 fr. as necessitated by the Brussels Congress. To meet this position he hopes to save 32,000,000 fr. by conversion of the Three-and-a-Half per cent. Rentes; 26,000,000 fr. on the interest of the new Three per cent. Rentes; 22,000,000 fr. from suppression of the Savings' Bank Redemption Fund; 11,100,000 fr. from the Chinese Indemnity, and 3,700,000 fr. from the suppression of the annuity to the school funds; further he hopes to realize 50,000,000 fr. from the *bouilliers de cru*, by modifications of the laws relating to private distilleries; 19,000,000 fr. from reduction of the privileged tobacco zones; 3,000,000 fr. from revision of the mortmain tax on buildings; 3,700,000 fr. from extension of the coupon tax to life annuities; 4,000,000 fr. from increasing the price of Maryland tobacco, and 44,000,000 fr. from the issue of sexennial bonds for the guarantee of interest to be paid the Railway Companies. The total expected to be produced by these proposals amounts to 218,500,000 fr., so that if expectations are realized, there should be a surplus of 11,500,000 fr. But it is proposed to apply 11,000,000 fr. to the redemption of existing sexennial bonds; hence the budget balances with an estimated surplus of 500,000 fr. only. According to a report of the Acting French Consul in London, the total import and export trade of France in 1901 was 8,800,000,000 fr., of which 1,931,000,000, or 22 per cent. was trade between France and the United Kingdom; of the French exports, worth 4,166,000,000 fr., nearly 30 per cent. (1,264,000,000 fr.) were accounted for by sales to Great Britain. France's next best customer was Belgium, with purchases worth 596,000,000 fr. Of imports into France, which reached a total of 4,714,000,000 fr., England supplied 14 per cent. (667,000,000 fr.), the United States following with 481,000,000 fr. France's total trade with Belgium was 982,000,000 fr., with Germany 878,000,000 fr., and with the United States, 721,000,000 fr.

Our usual table of exchanges follows:—

	28th Aug.	29th Sept.	29th Oct.
Paris, cheques	25f. 18c.	25f. 16–½c.	25f. 12c.
Berlin, sight	20m. 48½pf.	20m. 45½–6pf.	20m. 46pf.
Vienna, sight	23kr. 96½h.	23kr. 95h.	23kr. 91h.
Amsterdam, sight	12fl. 12½	12fl. 13	12fl. 13½
Madrid, sight	34ps. 46	—	33ps. 25
Lisbon, sight	41½d.	41½d.	42½d.
St. Petersburg, 3 months	94r. 15	93r. 90	93r. 85
Bombay, T.T.	1s. 3½d.	1s. 3½d.	1s. 3½d.
Calcutta, T.T.	1s. 3½d.	1s. 3½d.	1s. 3½d.
Hong Kong, T.T.	1s. 8½d.	1s. 8½d.	1s. 8½d.
Shanghai, T.T.	2s. 4d.	2s. 3½d.	2s. 3½d.

AGRICULTURAL RETROSPECT.

UNITED KINGDOM.—The weather of October was generally favourable to ploughing and sowing, which is the most important work of the month. The root crops have benefited by the rain, and this may increase the weight of swedes materially. The mangold crop has now been secured in many places, any delay after the end of October involving risk of damage by frost; this crop has realised the highest expectations, and a yield per acre considerably above the average will undoubtedly be recorded. The potato-crop is a very poor one, and the proportion of tubers free from disease is small. It is significant of the failure in the home-grown crop that our imports of potatoes have expanded enormously in the last few weeks. If the cereal crops which have been harvested this year in Great Britain had only proved as fine in quality as they appear to have been large in yield per acre, the season of 1902 would have deserved recognition as a memorable one. The results of the *Times*' annual enquiry show wheat, barley, and oats to be all above average in their yield of bushels per acre. Glancing first at the wheat crop, nearly all the English counties report an average yield of 30 bushels or more per acre, whereas last year there were only two dozen counties coming up to this level. On this occasion four or five counties average the yield at over 35 bushels. Calculating the mean of the estimates received from all parts of the country, the *Times* records a general average yield of about 33 bushels of wheat per acre, which compares with the latest official decennial average of 29.9 bushels. The chief defect of this year's crop is not in deficiency of straw, as was the case in the crop of last season, but in low quality of grain resulting from the inclemency of the weather over the exceptionally protracted period of harvesting. In the case of the barley crop the average yield works out at over 35 bushels per acre in about one-half of the counties of England, and it is doubtful if any county falls below an average of 30 bushels. Both Wales and Scotland indicate rather better average yields than England, and, as between them they account for about one-fifth of the barley acreage of Great Britain, they exercise an appreciable influence upon the average for the whole island, which works out at between 36 and 37 bushels per acre, compared with the official ten years' average of 32.8 bushels. Oats appear to have given an extraordinary yield this season, more than half the counties of England averaging the crop at over 45 bushels per acre, and few falling below 40 bushels. The mean of the *Times*' estimates for Great Britain indicates a general average yield of over 46 bushels per acre, compared with the official decennial average of 38.3 bushels. Oats, despite their big yield this season, are like wheat and barley in that they lack quality, as is shown in many cases by their lightness in weight per bushel. The resemblance between the season of 1902 and that of 1894, states the *Times*, is maintained to the end, for, in both years, wheat, barley, and oats all gave over-average yields of grain, the quality of which was much impaired by inclement weather preceding and during harvest.

A leaflet has been issued by the Board of Agriculture on the causes and prevention of the disease known as "finger-and-toe" in turnips. This disease—known also as Anbury, Club Root, and "Grub"—attacks most, if not all, cruciferous crops. The source of the mischief is a fungus which may exist for some years quiescent in the soil, but when a crop that it can attack is sown upon the ground, it enters the fine roots, and rapidly induces malformation and decay. The disease is extremely infectious and spreads through being carried in the soil which sticks to the wheels of carts or agricultural implements, the boots of workers, or the feet of horses or sheep. Or some of the diseased turnips may get amongst the dung which, in the succeeding season, is used to manure a turnip crop on another field. Or diseased roots may be spread on a grass field to be consumed by stock, and a year or two later this field may be under turnips, when serious infection may be revealed. The most effective preventive lies in the application of burned lime, 5 to 7 tons per acre, the dressing being given in the autumn, either six months or eighteen months before a turnip crop is to be grown. Another system is to put on a small dressing, say 1 to 2 tons, directly after a turnip crop is removed. To spread such a small quantity evenly over the land, it is necessary first to slake it and afterwards to fill it into carts, spreading by means of shovels directly from the carts. If a considerable amount of disease is present, the dose of lime may be increased somewhat, whereas if the field is sound, or nearly sound, the dressing need not exceed 1 to 1½ tons. In this case the treatment is to be regarded purely as a preventive measure. Other forms of lime are also more or less effective, though none is so powerful as common burned limestone, which is slaked before spreading. If gas-lime be used, it should be put on not later than eighteen months ahead. Although many farmers appear to think that this disease can only be prevented or cured by the use of lime, there is no doubt that its spread and virulence can be greatly affected in other ways. It often happens that, to begin with, the disease appears only in certain small portions of a field, frequently the headlands, and while it is still on a circumscribed area, no trouble or expense should be spared to stamp it out. Land that is soured by want of drainage, or a patch that is suffering in consequence of a burst drain, frequently exhibits the disease. Neglecting to keep land clear of charlock and other cruciferous weeds must contribute to the spread of

the disease, for it is in such plants that the fungus lives when a field is not in turnips. Experiments have shown that acid manures encourage finger-and-toe, and this fact should be borne in mind in the cultivation of land that exhibits a tendency to this disease. The best phosphatic manure to use, under these circumstances, is basic slag or precipitated phosphate.

COLONIES.—In his annual report to the Colonial Office on BARBADOS, the Governor, Sir F. M. Hodgson, refers to the condition of the agricultural industries of the island in the following terms:—The cultivation of the sugar cane is the agricultural industry of absorbing importance in Barbados. The soil and climate are adapted to it, and labour is plentiful. Nearly all the available area of the island is under sugar cultivation, which has been brought to a very high standard of efficiency. It is when the manufacturing process commences that a lack of progress is observable. There are 445 sugar estates, and of these 343 are dependent upon wind power for cane crushing; 102 estates have installed machinery worked by steam, and of these eight have vacuum pans. Not a single estate has yet installed the requisite machinery for the extraction of the maximum quantity of juice obtainable from the canes, and in the present critical state of the industry this is not to be looked for, excepting with the assistance of the Government. The matter is necessarily engaging attention. The majority of planters have long seen the necessity for better methods, but the gradual reduction in the market price of sugar, and the lack of combination among themselves, have prevented their finding the requisite capital. But the question of the hour has been not so much the improvement of methods of manufacture by the establishment of central factories, or otherwise, as the saving of the sugar industry, and the vast population dependent upon it for support, from absolute ruin. The reassembling of the Brussels Conference at the instigation of the Imperial Government for the purpose of considering the general abolition of bounties is looked forward to with keen interest, as upon the result arrived at depends in a great measure the possibility of the local government being able to maintain the credit of the colony, and to arrive at some means for keeping the population in employment. When this has been secured as far as possible, the question of the establishment of central factories will have to be taken up and finally dealt with. Among the minor industries is mentioned the cultivation of arrowroot, which is principally carried on in small plots by labourers in their spare time. The annual yield is about 2,700 barrels, and the value, at the low price of 9s. per 100 lb., about £5,000. Efforts are being made by the Imperial Department of Agriculture to establish a trade with England in sweet potatoes, and a small trial shipment has been made with satisfactory results. The potatoes arrived in good condition, and the industry would, it is believed, become a profitable one if it can be found possible to extend the sales. A pamphlet containing fifteen recipes for cooking sweet potatoes, has been prepared by the Department, copies of which were distributed with the first consignments. The cultivation of sugar forms the principal agricultural industry of FIJI. The Colonial Refining Company, Limited, of Sydney, are the largest producers. They own three mills in the colony. A fourth is being erected, and is expected to start crushing in 1903. It is situated at Lautoka, in the Island of Vitilevu, about 20 miles from the same company's Ba Mill, and the large areas of land in its vicinity are already under cane cultivation. The experiment of cane growing on reclaimed mangrove swamp is still being extensively carried on in the Labasa district, and seems to promise very satisfactory returns. The total area of land in the colony under cane cultivation is estimated at 27,399 acres, from which were produced in the year 1901-2, 291,629 tons of cane.

FOREIGN COUNTRIES.—The grape harvest in FRANCE, in so far as bulk is concerned, is nearly everywhere inferior to that of last year. In quality it is reported to be very irregular, except in the southern vineyards, where it is distinctly good. The lifting of the sugar beet crop is being proceeded with in the north, but, according to the *Journal de l'Agriculture*, the yield is much smaller than the vigorous leaf development gave cause to anticipate. As some compensation for this, however, the roots are reported to be exceptionally rich in sugar. The potato crop, as at home, is very indifferent in both yield and quality. The study of soils is being prosecuted with greater vigour in the UNITED STATES than probably in any other country. The investigation and mapping of soils in the field is only part of the work, which is supplemented by the chemical and physical examination of soil samples in the laboratory. There is a well-known and time-honoured method of testing the capillary power of soil by observing the rise of water in a column of dry soil contained in a glass tube, but it has now been ascertained that this does not give the height at which capillary action operates under natural conditions in the field when the soil contains more or less moisture. The difference, indeed, is so marked that laboratory experiments with dry soils fail entirely in affording a quantitative measurement of the extent of capillary movement in the same soil in moist condition. In the Sea Island cotton soils, for example, the capillary rise in the moist soil is over four-and-a-half times that taking place in the dry soil. Other experiments are in progress to determine whether a constant ratio exists between the two determinations for any soil. If no such relation can be established, the measurements of the capillary rise of water in dry soils which have been

so extensively made in the past are of little or no value in interpreting the relation of a soil to water under field conditions. This power of soils to transport water through capillary action is particularly important in connection with problems relating to alkali soils. As to the influence of dissolved salts on the capillary rise of soil waters, it has been found that sodium carbonate has a marked effect in apparently facilitating the rise of water, at least in dry soils. This is attributed, in part at any rate, to the solvent action of the carbonate on any grease that may be present on the surface of the soil particles, which would consequently offer a cleaner surface to the ascending water. As bearing upon the relations of carbon dioxide (carbonic acid gas) to the soil, it has been found that if specially purified quartz sand be left exposed to the air it will take up by absorption 200 times as much carbon dioxide as would be contained in a volume of free air corresponding to the total volume of the interstitial space in the soil. The atmosphere, within ordinary soils, contains from 30 to 200 times the percentage of carbon dioxide found in the free atmosphere above the soil, so that the amount of carbon dioxide actually absorbed and held by the soil particles must be enormous. Soils undoubtedly differ in their capacity for holding carbon dioxide, but the amount in any case is probably very great. This propensity of the soil to absorb large quantities of carbon dioxide has an important bearing upon sodium carbonate, which constitutes the worst form of alkali in soils. When the carbonates of soda, lime, or magnesia are brought into the presence of carbon dioxide under normal conditions they are very largely converted into bicarbonates. In the case of the lime and magnesia salts this greatly increases the solubility of the material. As regards sodium carbonate, it is, after being converted into the bicarbonate, much less harmful to plants. Laboratory investigations show that, whilst sodium carbonate is one of the most harmful salts, sodium bicarbonate is one of the least harmful. Anything that will increase the amount of free carbon dioxide in the soil, such as decaying organic matter, should have a tendency to convert the carbonate into the bicarbonate, and so diminish the danger from the presence of the sodium salts. In view of their economic importance, not only in the "bad lands" of the United States, but in a considerable area of the Canadian prairie adjoining the 49th parallel of latitude, it is satisfactory to know that these matters are undergoing further investigation in the laboratory, at the hands of Dr. Milton Whitney, chief of the Division of Soils at Washington, and his colleagues.

LABOUR RETROSPECT.

UNITED KINGDOM.—The extent of the backward movement in industry can be deduced from the returns published in the October number of the *Labour Gazette*. The falling off is most marked in the shipbuilding and engineering trades. On the other hand, employment for miners has remained good, and some branches of the textile industries have improved. In the 221 trade unions, with an aggregate membership of 553,870, making returns 27,522 (or 5.0 per cent.) were reported as unemployed at the end of September, as compared with 3.7 per cent. in the 216 unions, with a membership of 542,917, from which returns were received for September, 1901. The mean percentage of unemployed returned at the end of September during the 10 years, 1892–1901, was 4.6. In coal-mining, employment continued good, and was about the same as a year ago. The pits worked on an average 5.35 days per week, and the number employed was 1.5 per cent. greater than a year ago. In iron-mining and in the pig-iron industry the days worked remained up to the average of the past twelve months. In iron and steel manufacture, employment was worse than the previous month, and showed a greater decline as compared with the previous year. The total volume of employment (taking into account both the number employed and the number of shifts worked) shows a decline of 2.1 per cent. as compared with a month ago, and 5.7 per cent. as compared with a year ago.

The tinplate trade furnished a happy exception. At the end of September, 895 mills were at work compared with 402 at the end of August, and 378 a year ago. Employment in most branches of the engineering, metal and shipbuilding trades showed a falling off when compared with August, and was considerably worse than a year ago. The building trades continued dull, the percentage of unemployed union members among carpenters and joiners at the end of September being 3.3 as compared with 2.8 at the end of August, and 2.8 in September, 1901. The percentage for plumbers was 5.9 as compared with 6.1 in August, and 5.3 in September of last year. Employment in the spinning branch of the cotton trade showed a decline, and was moderate. In the weaving branch it has improved, but is still only moderate.

Information respecting cotton factories employing about 82,000 women and girls, shows that 82 per cent. of those in spinning mills were working in mills giving full employment during the whole month, compared with 85 per cent. during August, and 88 per cent. a year ago. The corresponding

percentage of full time for those employed in weaving factories was 79 per cent. during September, compared with 72 per cent. during August, and 69 per cent. a year ago.

The arrangements are now practically complete for the commission of enquiry which Mr. Alfred Mosely, C.M.G., is taking across the Atlantic at the end of the month to study the relations of capital and labour and the conditions of production in the United States. The delegates will probably number 25, and nearly all the societies that were invited to send representatives have now made their selection. The following is a list of the institutions which are represented:—Amalgamated Carpenters and Joiners, Operative Bricklayers, Operative Plasterers, Amalgamated Engineers, Ironfounders of Great Britain and Ireland, Boiler Makers and Iron and Steel Ship Builders, Associated Iron and Steel Workers, Associated Shipwrights, Sheffield Trades, Amalgamated Operative Cotton Spinners, Amalgamated Tailors, National Union of Boot and Shoe Operatives, National Amalgamated Furnishing Trades, Amalgamated Leather Workers, Amalgamated Lithographic Printers, London Consolidated Bookbinders, Amalgamated Paper Makers, Northern Counties Amalgamated Weavers, Blast Furnacemen, London Trades Council, Trades Union Parliamentary Committee. Special enquiry will be made into the working of the Civic Federation, a powerful body, comprising some of the best minds of the country, which is prepared, on the invitation of both parties, to arbitrate on questions they cannot settle by themselves. This organisation offers its services at the first signs of a dispute, before any bitterness has been imported into the question at issue. The results of its mediation are, in many cases, excellent, and Mr. Mosely hopes that a similar organisation may be introduced into this country.

In the report recently prepared by a special Commission appointed by the British Iron Trade Association to study the differences between American and British labour, Mr. James, who gave special attention to the steel industry, refers to the idea that the American workman works harder than his British colleague, and says this is not strictly correct. "They are attentive and quick at manipulating levers and similarly easy work. They are also much more desirous of getting out large quantities than in England. They are better paid and more regular in their attendance at the works, loss of time through drinking habits or otherwise not being tolerated." Mr. Sahlin, an expert in blast furnace work, in his report, says that "the American workman generally aspires to higher grades of labour, leaving the purely manual labour to workmen from other countries. Thus, it is," he says, "that around American blast furnaces the American is found in a very decided minority. He may be foreman, master mechanic, blast engineer, locomotive driver or stove tender, but he will not work 84 hours per week shovelling ore or wheeling scrap. For these duties are employed, in the south, the negroes, and, at northern furnaces, immigrants, mostly Irish, Slavs, or Italians." As to the cost of living, Mr. Jeans declares that "the average American workman, in most of the essentials of life, can live, *mutatis mutandis*, as cheaply as he can in the old country." Commenting on this report, *Bradstreet's* remarks that all of this reads very nicely, were it not for the evidence that a very large section of the community—in other words, the labour organizations—are apparently not satisfied with present conditions, and are evidently aiming to transplant the system of restriction of individual effort, which has been brought to such perfection in the United Kingdom.—The tendency towards the reduction of hours noted of late years is an example of this. That this reduction of time must result in a greater initial cost, which will cripple the employer in competing with the rest of the world in the field of international trade, would seem a foregone conclusion were it not for the fact, proved often in the past, that necessity will cause the invention of machinery, which will act as a counterbalance, and still further lessen cost. The net result must, however, be an unsettlement of the basic conditions which govern productive industry, and one which, from the standpoint of labour itself, will, in the long run, prove detrimental. It would seem as if the best interests of all concerned would lie in a clearer view of the real circumstances governing production, and that the American workman should, like the German, and unlike the British workman, see that his interest, like that of his employer, lies in the cheapening of cost, or at least in keeping it down to a point which will allow of us underselling the foreign producer.

COLONIES.—Regarding the prospects of employment for whites in the new colonies, many conflicting statements have been made. The Trades and Labour Council of Cape Colony describe the labour market there as being greatly overstocked. They state that about a hundred artisans lately reached Cape Town under the auspices of a labour agent in London, who had promised them immediate employment upon landing, and that none of these men found any work. In the Transvaal and the Orange River Colony first-class mechanics in the building trades are in request, whilst in Natal an over-supply already exists; the obvious lesson being that men in that line had better stop at home. The immigrant with capital and special knowledge comes under another category, and is generally welcome. A young engineer or surveyor starting in Cape Town with £200 to live on while looking round, will not have to wait long before finding employment, and, once started, his advance should be rapid. The new colonies, without doubt, possess great possibilities of development, but too great insistence cannot be made on the point that much capital must be expended before this development is effected. And until the money is in the country, the demand for fresh labour will not be great. If the influx of whites

continues, while the mines are only partially working, distress is certain to be occasioned.

The Committee of the Chamber of Mines, the Committee of Consulting Engineers, and the Association of Mine Managers have prepared an important report on the labour question. They state that they have considered proposals regarding Canadian, Australian, Italian, Cypriot and Tunisian labour, and are of opinion that there would be no advantage in dealing with them at present. Three courses are open, they continue, to restore industry to the position it occupied before the war, namely, white unskilled labour in part as a substitution for native labour, an adequate supply of native labour, and imported coloured labour. They consider the success of the proposal regarding white labour impossible as a practical solution of the difficulty. Regarding the payment of natives, it is pointed out that the old "boys," who attained a considerable degree of skill, will not return unless they are paid higher wages, and it is further pointed out that other conditions exist which render it necessary to make wages more attractive. It recommends that the recruiting of unskilled labourers be confined to Africa, that the organisation of the Native Labour Association be strengthened, and that the pay of natives be increased, but so regulated that their average earnings do not exceed 50s. either for piece or day work. This computation is based on the average earnings of natives before the war. The adoption of the recommendations is contingent upon the present arrangements of the Native Labour Association for the recruiting and distribution of natives being rigidly adhered to.

The annual report on the Federated Malay States contains many references to labour difficulties. The cost of living—food, wages, etc.—and of mining has so greatly increased of late years, while the exchange value of the dollar has decreased, that, with tin at, say \$60 a picul of 133½ lb., a considerable number of existing mines would be compelled to shut down or work without profit, until the rates of wages re-adjusted themselves. At Selangor, the Acting Secretary for Chinese Affairs reported that the miners had a bad year, owing to the claims for wages from coolies and disputes, which exceeded those of all former years. He attributed the cause chiefly to the scarcity and dearness of labour. There has been a falling off in the supply of Indian labour. Of the 10,000 tickets for passengers from India to the colony and Federated Malay States which the Government guarantee annually, only 7,243 were taken up. This is partly attributed to the improved conditions of life of the coolie in India, and partly to the more stringent compulsory medical examination of intending emigrants from Negapatam. It has been necessary to increase the rate of wages offered by Government, and it is proposed to raise the minimum rate of wages of statute immigrants fixed by law.

FOREIGN COUNTRIES.—In FRANCE the trouble in the coal-mining industry again broke out. The men demanded that the question of the superannuation fund should be settled without delay, and that the eight-hours working day arrangement should be extended. They also required the wages question gone into, and demanded a settlement on a number of minor points; such as the representation of the miners on the board of inspectors. The strikers obtained for a time the co-operation of the dockers at Dunkirk and Marseilles, who decided not to unload any British coal until the miners' demands were satisfied. This step was not very successful. A movement on the part of some extremists in the BELGIAN coal trade to take advantage of the situation by bringing about a general strike, was checked by the council of the Miners' Federation. Considerable unrest, however, still prevails. The coal strikes in the UNITED STATES, after lasting 23 weeks and causing, it is estimated, a general loss of \$140,000,000, was terminated by the mediation of President Roosevelt. That the end came none too soon is evidenced by the fact that the weekly normal output of 1,300,000 tons decreased to about 98,000 tons. The President did not ask for any statement of claim, but appealed to the men's patriotism to avert the national catastrophe which a winter coal famine would bring about. He also promised to appoint a commission to investigate thoroughly the matters at issue. After prolonged conferences the constitution of this commission was agreed upon.

In a series of articles in the *Moscow News*, the writer shows by means of figures that not only RUSSIAN capital, but even Russian labour in the Russian naphtha-bearing regions, is being gradually ousted by British and other foreign labour. He shows, *inter alia*, that while the percentage of Russian hands employed at the Caucasian and other wells has fallen considerably during a recent period of 12 months, the percentage of the foreigners, for the most part British, has risen during the same period from 17.9 to 21.7 per cent. He adds that at the present moment the efflux of Russian labourers from the Russian oil-bearing regions has swollen to such an extent that it has become nothing more or less than an emigration *en masse*, and he accuses the Russian authorities, not only of apathy in the matter, but of open administrative approval. He quotes Russian official statistics as proving that, during the nine months ending February of the present year, no less than 8,500 Russian hands, with their families, were deported out of Baku alone in consequence of the immigration into that town of British and other foreign workmen. The correspondent of *The Times* adds, by way of comment, that, though foreign labour is undoubtedly increasing at the Russian oil-wells and manufactories in Baku and the Caucasus generally, the writer apparently overlooks the fact that the Russian oil industry has of late suffered considerably from unfair competition, low prices, and other causes whose operation is likely to be only temporary. The recent depression has naturally resulted in the discharge of many men, and one explanation of the difference in the proportion of Russian to foreign discharged hands is to be found in the fact that the foreigner is, as a rule, a skilled workman and imported on a contract, while the bulk of Russian labour at the wells and factories is dischargeable at comparatively short notice.

SCIENTIFIC AND TECHNICAL DEPARTMENT OF THE IMPERIAL INSTITUTE.

EXPERIMENTS ON THE LATEX AND RUBBER FROM *CASTILLOA ELASTICA*.

There are many important problems in connection with the extraction of the latex from rubber trees and its conversion into rubber which require careful investigation by scientific observers, and considerable interest, therefore, attaches to a series of articles contributed by Dr. C. O. Weber, a well-known rubber expert, to *The India-rubber and Gutta-percha Trades' Journal* (Vol. XXIV., Nos. 6, 7, 8), giving an account of some experiments which he conducted while on a visit to the rubber plantation of the Las Cascadas Plantations Company on the Isthmus of Panama.

The plantation is situated in the hilly district near the town of Panama, where the land rises very gradually to a height of 1,200 feet or more, and, at the lower altitudes, is eminently suited for the cultivation of rubber, cacao and coffee. The Central American rubber tree, a variety of *Castilloa*, is the one cultivated, and, at the present time, the plantation contains 70,000 of these trees, of which 15,000 are from eleven to twelve years old. An exact botanical identification of the tree was difficult, since at the time of the visit neither flowers nor fruit were present, but, from a close study of the morphological characters, Dr. Weber concludes that it is almost certainly the true *Castilloa elastica*. Very discrepant accounts are given by different observers as to the quantity of rubber which can be obtained from a *Castilloa* tree, figures ranging from 2 to 49 lb., or even more, being quoted as the yield from trees growing in Central America, while, on the other hand, experiments conducted by Dr. Trimen in Ceylon upon a large number of trees gave a maximum yield of only 4.3 oz. The yield of rubber from the trees at Las Cascadas was as follows:—

Age of tree.	Yield of latex.	Percentage of rubber in latex.	Yield of rubber.
6 years . . .	1 lb. 13 oz. . .	26 . . .	7.5 oz.
7 „ . . .	2 lb. 5 oz. . .	26 . . .	9.6 oz.
8 „ . . .	3 lb. 1 oz. . .	29 . . .	14.2 oz.
11 „ . . .	5 lb. 3 oz. . .	31 . . .	25.7 oz.

The yields from the trees of eight and eleven years of age represent the means of a number of experiments, while the figures for the younger trees are the means of two trials; the results were considered to be rather below than above the average. The trees can be tapped with perfect safety twice a year, so that the annual yield of rubber would be twice that given in the above table. There is little doubt that the amount of rubber yielded by the same tree in different districts is liable to considerable variation, and the need for careful experiments before the cultivation of any particular variety is undertaken upon a large scale cannot be too strongly emphasised.

The yield of rubber is, of course, intimately associated with the amount of latex furnished by the tree, and many experiments have been made from time to time to determine the best method of making the incisions in order to secure the maximum quantity of the latter. The point to be aimed at in the tapping process is to obtain as large a supply of latex as possible without in any way injuring the vigour and growth of the tree. It is clear that the best method of making the incisions will depend largely upon the distribution and arrangement of the laticiferous tissue, and, as the latter may vary widely, it is impossible to lay down any universal rule; the method of tapping must be adapted to suit the particular conditions. The laticiferous vessels in rubber trees are usually stated to lie in the layers of bast immediately beneath the bark, without extending into the wood, but Dr. Weber found that in *Castilloa*, although the bulk of the vessels were thus situated, there were also a number of large ducts distributed through the wood, and a considerable number surrounding the pith in the centre. Whether these inner vessels communicate at all with the outer ones was not investigated at the moment, since, in any case, only the external vessels lying in the bast can be opened without risk of seriously injuring the tree. In the bast the vessels were found to run longitudinally, and there was surprisingly little evidence of any lateral intercommunication between them. This observation at once explained the fact that longitudinal incisions in the bark gave either an extremely small flow of latex, or, in many cases, none at all, and suggested that horizontal cuts would yield the best result. In the case of *Castilloa*, however, a horizontal cut is not very satisfactory for the collection of the exuding latex, and, in addition, a large number of such cuts require to be made in order to extract the whole of the available latex, so that it was found preferable to employ a continuous spiral cut which can be made to drain practically the whole of the trunk. A spiral incision of this kind, made at an angle of not more than 45 degrees, gives an excellent result as far as the flow of latex is concerned, and is much better than the system of making a series of V-shaped cuts connected by a single vertical one.

The method of making the incisions is of some importance, since if they are carried too deep there is danger of inflicting permanent injury upon the tree, though Dr. Weber, as the result of his observations, expresses the opinion that cuts penetrating to the wood are not necessarily injurious to the tree, but may retard the healing process. With a view to preventing the attacks of insects on the exposed surfaces, the wounds were treated with an antiseptic paint, and it was found that this materially assisted the healing, as in these cases the cuts began to close up a week after the tapping. A new kind of tool, enabling a clean and continuous cut to be made, was also introduced with very satisfactory results, and particulars of this are promised in a later communication.

The latex obtained from *Castilloa elastica* at Las Cascadas does not flow like milk, but issues from the cuts in the form of a thick cream containing a very high percentage of rubber. This point again illustrates the variation shown by the same tree growing in different districts, for while a similar latex is yielded by *Castilloa elastica* in some parts of Guatemala and Venezuela, yet in general it gives a fairly thin milk. The variation in this respect cannot be due to a difference of species, differences of altitude, or range of temperature, but may possibly be connected with the condition of the soil and the annual rainfall. At the moment of issuing from the cuts the latex forms an almost pure white creamy mass, which, however, almost immediately begins to discolour, and in a very short time becomes brownish-black, changes due to the presence of an oxidising ferment in the latex. It is intensely bitter in taste, due, it is thought, to the presence of a glucoside, and contains a large percentage of albuminous matter, which may reach as much as 11 per cent. This latter fact is thought by Dr. Weber to account for the ease with which *Castilloa* latex can be coagulated, rather than the large size of the rubber globules to which it is generally attributed.

The methods adopted by the native collectors for coagulating *Castilloa* latex vary considerably, and are usually of a very crude nature. The following are the most important:—

1. The latex is washed with water, but just as often this is neglected, and is treated with a decoction of the crushed stem of the moon-plant, *Calonyction speciosum*, which is strongly acid in reaction. This is the process employed in British Honduras.
2. The latex is treated with the juice expressed from *Ipomoea bona nox*, which is stated to be strongly alkaline, though this latter point is open to considerable doubt.
3. The latex is collected in shallow holes dug in the ground, and is mixed with a boiling solution of soap in water. This method is extensively used in the Isthmus of Panama.
4. The latex is treated with a solution of alum.

5. The latex is coagulated by boiling in earthen vessels. This process is said to be employed in Mexico.

These methods need not be referred to in further detail, since they are all more or less unsatisfactory, but it may be noted that the fresh latex obtained at Las Cascadas, after being slightly diluted with water, was not coagulated even by prolonged boiling, but if allowed to stand until it had assumed a very dark colour it was rapidly and completely coagulated by the application of heat. The serum of the latex, which contains a large amount of albuminous matter, also showed a similar behaviour. In all the above methods the separation of the rubber appears to be brought about indirectly, the added substance really coagulating the albuminous matter present, and this coagulum carries with it the rubber globules previously suspended in the latex. The rubber thus obtained is, therefore, always contaminated with albuminous matter, often containing from 9 to 13 per cent. of the latter, and it is the presence of this which makes Castilloa rubber, as usually prepared, so prone to putrid fermentation. The value of the rubber would be greatly increased if these albuminous substances could be eliminated, either by removing them from the liquid before coagulation, or by bringing the latter about in a manner which does not also involve the coagulation of the albumen. Methods have been already suggested for accomplishing this in special cases, and a very simple process, applicable to Castilloa, is now given by Dr. Weber. It has been observed that if Castilloa latex be diluted with water and allowed to stand it "creams," i.e., the rubber globules rise to the surface, but do not unite to form a coherent mass. Dr. Weber finds, however, that if formaldehyde be added to the diluted latex the rubber globules, which separate, do coalesce to form a cake, while all the albuminous matter remains in the liquid. In carrying out the process the crude latex was first diluted with at least five times its volume of water, and in dealing with the thick latex obtained at Las Cascadas, it was found advantageous to dilute with boiling water, but this plan would not be applicable in all cases. The diluted latex was then strained through cotton gauze into well-washed petroleum barrels, to each full barrel 8 oz. of formaldehyde was added, the whole was well stirred and allowed to stand for 24 hours. The formaldehyde prevented any coagulation of the albumen in the hot solution, and also caused the rubber to separate as a white mass of such strength and toughness that it could be lifted entire from the barrel. This mass of rubber is rather porous and contains a quantity of the liquid enclosed in its cavities, so that it is at once cut into strips which are thoroughly washed with water until quite free from albuminous matter, and then dried. The rubber thus obtained is of exceptional purity, it does not undergo any change on keeping, and could be used for many industrial purposes without further treatment. The dry strips are extremely light in colour, semi-transparent, and, when dissolved in the usual rubber solvents, form almost glass-clear solutions; the characteristic rubber smell is almost entirely wanting, the strength is said to be superior to that of washed and dried strips of Para rubber, and the behaviour in the vulcanizing process, and the character of the vulcanized product are at present under investigation. An analysis of one of the strips showed that it contained only 2.6 per cent. of resinous matter, 0.44 per cent. of ash, and no albuminous or insoluble constituents.

Some interesting observations were also made regarding the amount of resin present in the rubber obtained from different parts of the same tree and from trees of different age. It was found that in an individual tree the resin increased in amount from the root upwards, and that the rubber from the younger trees always contained a far larger proportion of resin than that from the older ones. The following table gives the differences observed:—

	Percentage of resin present.
Rubber drawn from trunk	2.61
" " " largest branches	3.77
" " " medium "	4.88
" " " young "	5.86
" " " leaves	7.50
Rubber from tree 2 years old	42.33
" " " 3 " "	35.02
" " " 4 " "	26.47
" " " 5 " "	18.18
" " " 7 " "	11.59
" " " 8 " "	7.21

Similar differences have been recorded in a few other cases, and the amount of resin present in a sample of rubber would therefore appear to depend not only on the particular variety of tree from which it was obtained, but also on the age and to a less degree on the part from which the latex was drawn. The above figures indicate that in the case of Castilloa it would not be advisable to tap the trees until they are at least 8 years old, not only in the interest of the life and development of the tree, but also in the amount of resin which may be safely admitted in rubber of high quality.

In conclusion, Dr. Weber gives some particulars concerning the prospects of rubber-planting in Central America, and one point mentioned is of interest to all intending planters of *Castilloa elastica*. It is stated that there are three varieties of the tree, viz., *alba*, *negra* and *rubra*, distinguishable only by the colour of the bark, but of very different value as rubber producers. The *alba* has a white bark of a distinct yellowish or pinkish cast; it is the hardiest of the three varieties, suffering little from the tapping process; it produces a thick, creamy latex, and yields the largest quantity of rubber. The *negra* has a very rough, dark bark; it readily yields a thin milk, producing a good rubber, but the tree may be easily bled to death in tapping. The third variety, the *rubra*, has a reddish bark which is very smooth, thin and brittle, and does not show the longitudinal furrows noticeable in the other two; it yields a very small quantity of latex, but the quality of the rubber is good. The *rubra* is very common all over Central America, and it is possible that it has been planted in a number of instances instead of the *alba*; indeed, Koschny is inclined to think that it was the *rubra* variety which gave such discouraging results in Ceylon and Java. In planting Castilloa, therefore, great care would appear to be necessary in order to make quite sure that the seeds or seedlings employed are really those of the best variety.

THE ECONOMIC PLANTS OF THE SUDAN.

In an article contributed to the current number of *Der Tropenpflanzer* Dr. J. J. David, who has recently made a journey through Egypt and the Sudan with the object of ascertaining what openings for German trade exist in those countries, gives some information regarding the natural products of the Sudan, from which the following particulars have been compiled.

Tamarinds.—The East Indian tree *Tamarindus indica* grows naturally to a small extent in Kordofan, but is especially abundant along the Blue Nile, where it bears fruit from June to August. The Kordofan supplies of pulp extracted from the fruit are all consumed locally, but from the Blue Nile districts considerable quantities are sent into Lower Egypt. The tree, in addition to producing pulp, is useful as a shade-tree and a wind-breaker, and for the latter purposes the author thinks it is better suited than the *Parkinsonia species* which the Government is now planting in the neighbourhood of Omdurman. No attempt is at present made to cultivate the tamarind, and the pulp is sent into the market mixed with seeds and fibre, and it is suggested that an improvement in the quality of the product and an extension in trade could be secured by attention to these points.

Gum Arabic.—Before the days of the Dervish revolt Sudanese gum, derived from various species of acacia, was in great demand in Europe, where, owing to its ready solubility,

adhesive properties and absence of colour, it brought better prices than the gums from Senegambia, Persia, India, etc. Since the suppression of the rebellion the gum trade has only slowly begun to recover itself, owing to the great depopulation of the country which occurred during the Dervish rule. The trade is at present almost entirely in the hands of Greek and Jewish merchants, who buy this commodity in small quantities along the White Nile from Arabs who have transported it down stream. The gum is collected by native shepherds, who make incisions in the trees during the winter months; from the cuts then made gum begins to flow in March and, with the advent of the dry season, hardens into 'tears,' which are then collected. That the trade is slowly being re-established is evident from the fact that the price of gum has risen from five shillings in 1900, to twenty-five shillings per cwt. in Kordofan at the present time. The latest statistics of export available are for 1900, when 44,000 cwt. were sent north by the military railway.

Cotton.—A variety of *Gossypium herbaceum*, different from that furnishing the valuable long staple Egyptian cotton, is grown throughout the Sudan, including Darfur and Equatoria, and yields a cotton of 'finess' and 'length' suitable for working. Egyptian cotton has, however, also been experimentally introduced into Tokar, Taka and Gallabat in the western part of the country. The natives sow their cotton during the rains in sufficient quantity only for their household needs. Cultivation on a more extensive scale has, however, now been undertaken by several Egyptians cotton dealers, who have purchased large tracts of land for this purpose in Berber and intend to inaugurate improved systems of cultivation to produce a fibre suitable for export in large quantities.

Sugar.—The sugar cane, although widely cultivated in Egypt, is not much grown in the Sudan, its place being taken by *Sorghum saccharatum*, which appears to be indigenous to the country and is known to the native as 'ankolib.' This plant requires less water for its successful cultivation than cane; it is planted usually in August and reaped in the following January. Like cotton only sufficient for local needs is grown. Although before the revolt small factories for sugar manufacture existed in Gedaref and Gallabat, all the sugar required is now imported from Europe. (cf. IMP. INST. JOURN. 1900, 210.)

Senna.—This drug is cultivated principally in the southern plains of the Sudan and is brought into the Berber, Khartum and Omdurman markets by the Bedouins. It is used locally and in Egypt in the form of an infusion for dysentery and is an ingredient in a refreshing drink in vogue among the Sudanese. The leaf collected is that of *Cassia obovata*; the price in 1900-1901 varied from 7s. 6d. to 10s. for bales of 200 lb.

Indigo.—This dye was formerly prepared from *Tephrosia apollinea*, and probably also from *Polygala tinctoria*, in the eighth and ninth centuries, and records are still in existence of a factory at Kamlin on the Blue Nile, but the industry has now entirely disappeared, although the soil and climate in this neighbourhood are eminently suitable for the cultivation of indigo-yielding plants.

Rubber.—Cakes and balls of rubber are from time to time offered in the Sudanese markets, but their origin is unknown. From their sticky character, however, they appear to be produced from a species of *Landolphia*.

In this connection it should be mentioned that on the occasion of Colonel Spark's expedition to the Bahr-el-Ghazal in 1899 several samples of rubber and gutta-percha were collected from unidentified trees in that neighbourhood, and were subsequently examined in the Scientific Department of the Imperial Institute. The rubbers contained a large proportion of pure caoutchouc and a small amount of resin, and were valued by brokers at from 1s. 10d. to 2s. 3d. per lb. The gutta-perchas collected at the same time were, however, not of a valuable character. The promising nature of these rubbers has led the Administrator of the Sudan to appoint an expert who is at the present time investigating the rubber-yielding trees of the country.

Cereals.—The principal food plant grown is *Sorghum vulgare*, locally known as 'Dhurra.' This is sown in the season May to July, during the rising of the Nile, and is generally ready for cutting in about 60 days. The ease with which it can be cultivated led to a large production in former days, when the excess was exported to Egypt—a state of things which will doubtless occur again in the near future when the country recovers from the ravages of the late rebellion.

In the Western Sudan 'Dhurra' is replaced by the 'Millets,' *Panicum miliaceum* and *Penicillaria species*, or by 'Telabun' (*Eleusine coracana*), since in this district irrigation of the land is not such a difficult problem as in the other parts of the country. In the basin of the Blue Nile near Fashoda both sorghum and true maize are grown on the black alluvial soil deposited by the river. It is computed that about two-thirds of the corn produced by the cereal plants here enumerated is used for the production of native beer. The author concludes by drawing attention to the slow but certain improvement of trade and commerce under the new regime, and regards the present time as auspicious for the establishment of planting and similar enterprises under European supervision.

MINERAL RESOURCES OF VANCOUVER ISLAND.

The mineral resources of Vancouver Island comprise coal, gold ores, copper-gold ores, with a little galena and magnetite. Although the first discovery of coal was made on the east coast of the island as early as 1835, no systematic prospecting or developing was commenced until 1849, when the Hudson's Bay Company brought a party of coal miners from Scotland and commenced work at Suquash. About 1852 the Company abandoned work at this point, and commenced mining for coal on the present site of the city of Nanaimo. In 1862 Mr. Dunsmuir discovered the Wellington Seam, on the Nanaimo River, and later formed a company which built the Esquimalt and Nanaimo Railway, and opened the Northfield, Union and Extension Collieries.

The history of metalliferous mining commenced with the discovery of placer gold on the Leech and Sooke Rivers, about twenty miles from Victoria, in 1860. These discoveries were succeeded later by others on the China and Granite Creeks, but it was really not until the commencement of the Klondike excitement that any really serious efforts were made in prospecting even the coast line on the western side of the island. Since then gold-bearing quartz, partially free-milling, copper ores, and iron ores have been discovered on the west coast, occurring in zones having a general trend to the north-west, as well as copper-gold ores in the south-eastern portion of the island on Mounts Mallahat, Skerrit, Sicker and Brenton. The Geological formation of the island may roughly be divided into three separate classes of rocks, viz.:—(1) Cretaceous sandstones and shales, in which occur the coal measures; (2) a belt of semi-crystalline slates; (3) Dawson's Vancouver Series which, according to his classification, embrace the igneous and metamorphic rocks, together with crystalline limestones. A very large portion of Vancouver island has not been explored and the geology of the country is only very imperfectly known, but it appears to be complicated, for whilst the zones of country rock have some regularity as regards strike and dip, yet the innumerable and extensive faults have greatly added to the difficulties in prosecuting and development work. There are no leads, and the ore bodies occur principally as lenses, either at the contact of igneous dykes and limestone, or in fissures in igneous rocks, or as lenses in schistose rocks. These lenses often occur in zones, and from their various outcroppings give the appearance to an inexperienced miner of a true fissure lode. Hornblende, containing an unusually large percentage of iron, forms extensive deposits.

Economic Features.—Starting from the south end of the island, the first productive district is Skerit Mountain, where, in 1897, was made one of the first locations of copper-gold ore recorded on the island. The ore body has a maximum width of about four feet, and occurs in shoots. The one on which most development has been done is 90 feet in length. The ore mined from it to a depth of 60 feet was shipped to the Tacoma smelter during the year 1900, and yielded from 12 to 15 per cent. of copper, about 7 oz. of silver, and \$1 of gold to the ton. The next productive portion of the island is that known as the Mount Sicker district, in which are located the "Leonora," "Tyee," and other mineral claims. The former has shipped in all about 35,000 tons of ore, and the latter has mined 60,000 tons. The ore is chalcopryite in a gangue containing barytes, garnet, quartz, and pyrites. The grade averages \$5 per ton of gold, 5 per cent. of copper, and variable silver values. These ore bodies are lenticular in structure, and occur interfoliated between schists with their lines of strike conformable to the schistosity of the rock, but apparently not conformable to the original bedding planes. The schistosity has been caused apparently through shearing movements resulting from the intrusion of dykes, and convulsions of the earth's crust. Travelling north from Mount Sicker, the coal measures are met with within a comparatively short distance, and extend northwards a distance of about 75 miles. There are collieries located at Extension, Alexandria, Nanaimo, Harewood, Wellington, and Union. All of these collieries, with the exception of the original Wellington colliery, are now producing bituminous coal, and a good quality of coke is being made at Comox. In the southern portion of this coalfield there are two workable seams. The upper seam, designated the Douglass, is mined at the Nanaimo and Alexandria collieries, whilst the lower only is mined at the old Wellington and Extension collieries, in which portions of the field the upper seam has been carried off by erosion. The most northerly productive area is along the shore of Quatsino Sound, where occur enormous outcrops of copper ore, which have been worked to a small extent. The known deposits of magnetite occur on the Gordon River, which empties into San Juan Harbour, on the Serita River, at Copper Island, and on the Sechart Peninsula. The workable deposits have been exploited during the past two or three years with a view of shipping the ore to the Irondale furnace, in the State of Washington, for manufacture into pig iron. From the facts stated some idea can be obtained of the possibilities of the mineral resources of Vancouver Island when thoroughly exploited and developed.

CORUNDUM DEPOSITS IN THE UNITED STATES.

A recent number of this JOURNAL (Vol. VIII. p.181), contains an account of the corundum deposits of Ontario, and the processes involved in the concentration of the ore and the preparation of raw corundum for the market. The following is a summary of a report, by Mr. J. Pratt (*Bulletin 180* of the United States Geological Survey), which deals with the occurrence and distribution of corundum in North Carolina and Georgia, and will serve as a supplement to the information contained in the previous article.

The corundum localities of the United States are, with the exception of those in Montana, Colorado, and California, limited to the Appalachian region, where, although the mineral is known to exist at points throughout nearly the entire length, mining has been confined to a narrow section of the southern portion.

There are three names in constant use to designate the varieties of corundum: (1) Sapphire, which includes all corundums that are transparent to semi-transparent; (2) Corundum, including the translucent to opaque varieties of all colours; (3) Emery, which is a mechanical mixture of corundum and magnetite or hematite. The last two varieties are those used in the arts for abrasive purposes, emery being used in much larger quantities than corundum.

Although any corundum that is transparent is included under the head of sapphires, many of these have distinct names in the gem trade; e.g., the blue, red, green, yellow, and purple sapphires, are known respectively as the oriental sapphire, ruby, emerald, topaz, and amethyst. There are also pink and white varieties.

Corundum used for abrasive purposes occurs as sand, crystal, or gravel and block corundum. The first-named is composed of fragments of the mineral diffused through the vein. The crystal variety of corundum, as the name implies, consists of crystals which vary in length up to three inches, and which are often so well developed that in crushing they break up into regular rhombohedra. This regular breaking destroys the cutting efficiency of the corundum, for irregular fractures produce the best cutting edges. The block variety often occurs in masses, from 10 to 1,000 pounds in weight, of almost pure corundum and also intimately associated with hornblende, feldspar, etc., making a rock which is tough and difficult to work.

The North Carolina locality which, at the present time, is attracting most attention as a source of corundum gems, is the tract of land between the Caler Fork of Cowee Creek and Mason Branch, tributaries of the Little Tennessee River. In the gravels of this valley ruby corundum has been found for a distance of three miles. The richest gravels were usually found covered by soil averaging about three feet in depth, and resting on a soft rock known as saprolite. The rubies are separated by hydraulic processes similar to those employed for washing gold-bearing gravels.

The prevailing rock of the district is gneiss of a grey fine-grained variety, throughout which a large number of garnets are distributed. It is mostly in a decomposed condition, although in washing the gravels and masses of saprolite, undecomposed rock has been uncovered, containing nodules of pure hornblende. The saprolite bordering these nodules often contains crystals of corundum.

In the neighbourhood of Betts Gap of the Cowee Mountains, corundum of a grey to a bluish colour but highly crystalline, exists in hornblende-gneiss, and a pink variety has been found in amphibolic schist.

The Cowee Creek rubies frequently contain inclusions such as rutile and menaccanite, which give rise to a cloudiness or sheen in the polished gem. Some large gems and a great number of small ones have been cut, which in colour and brilliancy are equal to the Burma ruby.

Under the head of corundum—the variety used for abrasive purposes—are included all the translucent to opaque varieties, sub-divided into block, crystal, and sand corundums. The mineral has been mined very extensively in Macon County, North Carolina, on the southern face of a hill situated about eight miles from Franklin. The formation consists of the dunite variety of peridotite and the largest veins of corundum follow the contact of this dunite with gneiss. The veins running within the peridotite rock do not, as a rule, extend far. On the north-east side of the formation a bench of ore twenty-five feet in depth, and two to five feet in width, was exposed, which consisted of nearly one-half corundum.

From the mines in this locality, block, crystal, and sand corundum ores have been obtained, all of which can be readily made into a commercial product, suitable for the manufacture of any kind of emery wheel.

Georgia corundum is well known and makes a good commercial product. The mining localities are not so numerous, nor are the peridotite formations so extensive as in North Carolina. The Laurel Creek mine, situated at Pine Mountain, Rabun County, has produced a considerable quantity of corundum, which also occurs in large veins at the junction of the peridotite with gneiss.

A HYDRAULIC MINING CARTRIDGE.

The Benjamin Shaw prize for industrial hygiene has been awarded this year by the Council of the Society of Arts to Mr. James Tonge, junr., M.I.M.E., of Westhoughton, Lancashire, for the Tonge patent hydraulic cartridge, an appliance which obviates the use of explosives in the working of coal, and in a recent number of the Society's Journal (*Journ. Soc. Arts*, Vol. L., p. 805) a description of the apparatus is furnished, together with particulars of its working.

The use of explosives in coal mines must always be a possible source of danger, since their employment is not only the chief cause of explosions in the workings, but also gives rise to many other minor accidents, such as those due to the handling of the explosive and the falls of roof or sides brought about by the firing. Apart from the deaths caused by big explosions, from 60 to 100 men lose their lives annually owing to accidents with explosives, and the fatalities due to falls are sometimes as high as 60 or 70 per cent. of the total. The Hydraulic Mining Cartridge has been designed to supply a method of working coal without the use of explosives, and it is claimed that, in addition to the safety thereby obtained, many other advantages are gained over the present system.

The cartridge consists of a steel cylinder, 20 ins. long by 3 ins. in diameter, divided into eight transverse chambers in each of which a small duplex ram is fitted. The chambers of the cylinder communicate with one another so that the rams work simultaneously, and by means of a special contrivance the distance to which each ram can be driven outwards is much greater than the diameter of the cylinder would appear to allow. The apparatus is worked by a small hydraulic pump of special design whereby water is forced into the chambers of the cylinder, consequently driving out the rams, which can be made to give a pressure of 3 tons per square inch or a total pressure of over 60 tons. This has been found quite adequate in all ordinary cases, and the standard sizes are designed for this pressure, but special cartridges could be easily made to suit any requirement. The water required for the whole operation is about 1½ pints, but most of this returns to the water tank of the pump at the conclusion and can be again used.

The practical working of the apparatus is extremely simple. After the coal has been undercut, a hole of 3½ ins. diameter and from 3 to 4 feet deep is drilled, in the usual way, parallel to the roof and as nearly as possible along the parting at which the coal usually comes away, or just below this point. The cartridge, with the pump attachment and one or more thin 'liners' to prevent the rams cutting into the coal, is then pushed to the back of the hole and the pressure is gradually increased until fully on. The effect of this is speedily demonstrated by the rumbling and cracking of the coal, which is allowed to continue until the back portion is broken off, after which the pressure is brought to bear at the front until the whole has been loosened. The whole process occupies about 10 minutes, and one man with a single cartridge can carry out 25 to 30 such operations per shift, or say 150 per week. The working cost is much the same as for an equal number of 'shots' using explosives, but in practice the hydraulic cartridge has been found to bring down more coal per hole than when explosives have been used and, in addition, the coal obtained is larger and not so much shattered, so that it does not break up to the same extent during transit. The results of practical tests extending over the last two years show that the adoption of the new method has increased the yield of large coal by at least 10 per cent., and from some seams an increase of 15 per cent. or more has been obtained, thereby adding considerably to the value of the coal.

The cartridges have been tried for over two years at several Lancashire collieries, and the results have been so successful that the use of explosives has been entirely abandoned at the mines owned by the Hutton Colliery Co. Ltd., where over 1,400 men are employed underground and where formerly 1,000 explosive shots were fired weekly. As an illustration of the work accomplished here it may be mentioned that during 1901 four machines were at work in one mine, and in that time 19,000 'shots' (as they are still called) were made, yielding 40,000 tons of coal, while in another case where a single machine was in operation 300 'shots' were made, bringing down 600 tons of coal. The machines have proved capable of continual usage without damage and, in the light of the results indicated, they may be considered a practical success, while the introduction of the system has also resulted in a distinct financial gain to the management.

THE RECLAMATION OF ALKALI LAND.

Attention has already been directed in this JOURNAL on several occasions to schemes which have been suggested for the reclamation of the alkali or usar lands of India. A similar problem is presented by the arid regions of the Western and Southern portions of the United States of America, where enormous tracts of land, such as that known as the Great Interior Basin, comprising practically the whole of Nevada with portions of Utah, Idaho, Washington, Montana, Oregon, and California, are practically uncultivated, owing to the presence in the soil of an excessive amount of soluble salts. Such lands are, of course, the result of a small rainfall, there being no other natural means of gradually removing the soluble rock constituents occurring in virgin soil. There are a few plants which grow on such land, but none of these possess any economic importance, and so considerable interest attaches to the suggestions made by Dr. H. Myers, at a recent meeting of the New York section of the Society of Chemical Industry, that it is possible under certain conditions to cultivate beet-root on alkali soils (*Journ. Soc. Chem. Ind.*, June 30, 1902, p. 834). The experiments from which the author deduces this conclusion, were carried out in West Weber, Utah, which has a particularly bad reputation, and has no natural means of irrigation. Artesian wells were first bored in order to obtain a sufficient supply of water. The latter contained, in the three wells used, from '0435 to '0448 per cent. of total solids. The following table gives a synopsis of the chief results obtained in the course of the experiments:—

Salts Present.	Original Composition of Soil.		Sugar obtained from Beets grown on this Soil.		Composition of Plot I. after removal of Beets.	Composition of Plot II. after removal of Beets.	Composition of Beet-root Ash.	
	Surface Foot.	Second Foot.	Plot I.	Plot II.			Plot I.	Plot II.
	Lbs. per Acre.	Lbs. per Acre.	Per cent.	Per cent.	Surface lbs. per Acre.	Surface lbs. per Acre.	Lbs. per Acre.	
Carbonates	128	2,160	Average weight of Beet 44 oz., containing 14.8 per cent. of Sugar.	Average weight of Beet 36 oz., containing 14.1 per cent. of Sugar.	1,200	204	54.7	36.2
Chlorides	560	360			360	80	64.9	24.2
Sulphates	—	3,000			240	80	68.6	41.7
Nitrates	120	80			80	12	—	—

An examination of this table shows that in the case of Plot I., a considerable rise of alkali from the sub-surface soil occurred, whilst in Plot II. this phenomenon is observed to a much less extent, so that an actual decrease in the soluble soil constituents takes place. The only difference in the method of cultivation of the two plots lay in the application of water, Plot I. being irrigated with a limited supply of water, no provision being made for

efficient drainage, whilst Plot II. was surrounded by ditches in which artesian water ran constantly, providing both irrigation and drainage. It appears, therefore, that beet-root tolerates a comparatively large amount of soluble salts in the soil, without serious detriment to the yield of sugar. From Plot II., which was six acres in extent, a total crop of 90.6 tons was obtained, furnishing an average yield of 14.1 per cent. of sugar containing 84.9 per cent. of true sucrose; so that not only can profitable crops be raised, but at the same time the condition of the land is improved and rendered more suitable for the cultivation of other plants. These results should be of great value to those interested in the utilization of the usar lands of India, where, however, the problem is further complicated by even greater alkalinity of the soil than in the cases mentioned above and by the expense and difficulty of irrigating crops.

THE EASTERN ONTARIO GOLD BELT.

The belt or strip of country along which auriferous deposits have been found at various points extends eastward from the township of Belmont, in Peterborough county, across the counties of Hastings, Addington and Frontenac, into the western part of Lanark, a distance of about 70 miles. Most of the auriferous deposits occur under similar conditions, the rock in which they are situated being usually diorite or some closely-related matrix.

The geology of the district may be summarised as follows: A series of diorites, crystalline limestones, and various schistose rocks has been cut through by granite, which now forms most of the higher hills and ridges in the district, the diorites and accompanying rocks occupying the valleys and lower-lying areas. Above these there occur in places areas of Silurian limestone and outliers of sandstone of doubtful age. Most of the gold deposits occur near the contact of the diorite and granite in cavities which appear to have been formed through the shrinkage of the granite.

The Gold Deposits.—The most westerly town in the gold belt containing deposits is Belmont. The mine is worked by the Cordova Exploration Company, which possesses a mill of 30 stamps; water is supplied from an artificial lake on the property which is estimated to hold 10,000,000 gallons of water. Motive power is obtained from the fall of water out of Decr Lake, and transmitted to the mine as compressed air. It is estimated that even in dry seasons the compressed air plant will generate at least 1,000 horse power. The country rock is diorite, carrying a large percentage of titaniferous iron, magnetite, and pyrite. Cracks have been formed in the diorite and have given passage in past geological times to heated mineral solutions, which have acted on the walls and enlarged the cavities. They are now filled by chloritic and biotitic schists with some auriferous quartz. There are several lodes, and their directions vary. The pyrites occurring in the schists is also auriferous, and carries as much as 5 or 6 ounces of gold to the ton. The main lode runs in an east and west direction, and has a dip of 75° towards the south.

The rock masses with which are associated the auriferous deposits pass northwards through Ledyard Round Lake, and Marmora. The only locality at which any exploiting has been done is Ledyard, and here the workings were filled with water at the time of inspection. Considerable quantities of magnetite have been worked here. Besides the Delaro mine (IMP. INST. JOURN., Vol. VIII., p. 70) there are other arsenical gold-bearing deposits along the North Hastings belt. That known as the Hawkeye property is of similar character and mode of occurrence, much of the ore is high grade, and a number of leases have been taken up. Similar deposits of mispickel occur at Malone and Marmora. In the townships of Tudor, Madoc and Elzevir, both auriferous quartz and mispickel exist and have been worked to a small extent, and in Kaladar and Anglesea there are valuable deposits.

THE ORE DEPOSITS OF THE BOUNDARY (CREEK) DISTRICT, B.C.

This district is that lying along the International boundary line in the neighbourhood of and between the valleys of the north fork of the Kettle river and Boundary Creek, B.C. Following upon the construction of the Columbia and Western railway a little over two years ago and the installation of smelters at Greenwood and Grand Forks somewhat later, the district at once took a foremost place in British Columbia lode-mining, and it now ranks as one of the most important producers of copper in Canada. Though the country is not rugged, prospecting has been difficult on account of the drift which conceals the rocks over a considerable portion of the surface. Eruptive rocks, including granites, greenstones, lavas and intrusive dykes, have the widest distribution, and altered sedimentary and metamorphic rocks are met with. The greenstone has the widest area of distribution and appears to consist of augite porphyry, while the dykes which traverse it consist either of grey hornblende, biotite granite or diorite porphyry. The ore bodies may roughly be divided into three classes: (1), the large low-grade copper-bearing sulphide deposits; (2), the oxidised copper veins; and (3), the small gold- and silver-bearing quartz veins; of the first class the most striking characteristic is their enormous size. In the Mother Lode mine, development work so far has exposed an ore body for a length of 1,180 feet, a width of 140 feet, and it is continuous to the bottom of the workings, at 500 feet depth. The Knob Hill Ironsides lead is probably of greater dimensions. The lowest stope are 700 feet below the highest point of the vein, and it has been proved for a width of 400 feet. The principal minerals present are pyrrhotite, chalcopyrite, and magnetite, with pyritic minerals. Marcasite, arsenopyrite, galena, and zinc blende, also occur in smaller quantities. Calcite and quartz are the common gangue minerals. The ores occur in all rocks except the most recent, and probably belong to the early Tertiary age. The value of the ores is principally in copper and gold, with accessory silver. Magnetite and pyrrhotite, when occurring alone, are generally barren in gold, and the best gold values are said to be obtained in the Mother Lode mineral, when the ore contains about 2 per cent. of copper. The ores, as a rule, are very low grade, lower than was at first hoped. This has been partly counterbalanced by the size the ore bodies have shown on development, and their remarkable adaptability to smelting. The magnetite quartz and calcite are present in the required proportion, so that no fluxing or roasting is necessary, and the cost of mining and smelting these ores is exceptionally low. It is generally admitted that many of the properties can only be successfully operated by doing their own smelting, and for this reason a union of the smaller mines has been suggested. A sample of ore from Greenwood camp, showed a net value of copper \$3.10, gold \$2.40, silver \$0.22, per ton of ore, while at Winnipeg mine values as high as \$30 per ton are reported, but the latter return is exceptional.

THE PEARL FISHERIES OF CEYLON.

A preliminary report has recently been issued by Professor Herdman, briefly setting out the results of investigations on this subject made round the coast of Ceylon. Professor Herdman and Mr. Hornell inspected the pearl oyster banks, which are opened for fishing at intervals of 9, 10, or 11 years, for two or three years at a time, and the marine fauna of the vicinity in the interests of the fishing industries, and finally it was decided that Galle would be the most suitable position for the establishment of a marine laboratory. Two cruises were made, the first being for the purpose of examining the oyster banks and investigating the marine zoology, and the second, on which they were accompanied by Sir William Twynan and Captain Donnan, to more closely examine the oyster banks likely to be valuable.

The most important banks in the Gulf of Manaar include the East and West Cheval, the Periya, and the Muttuvaratu Paars, and although careful search was made no new banks of

adult oysters could be found, although several small beds of young and immature oysters were noted for the first time. Unfortunately, on most of these beds the young oysters (four or five months old) were deposited so thickly that only a small proportion would ultimately attain maturity, in fact the deposit on the Periya Paar alone was estimated at over a hundred thousand million. Experiments were therefore started, and will be continued by Mr. Hornell at Galle, on the best means of transporting the oysters from the overcrowded banks to open suitable beds which will probably be made up near the Cheval Paar and Galle. The few trials already made show that transporting can be carried out without great damage to the oysters.

All the samples of oysters obtained were examined in order to detect the presence of any injurious parasite or abnormal disease; but nothing of that nature could be found, and they were considered to be in a very healthy condition, the nature of their sea bed being highly suitable. With regard to the prospects of fishing, a fuller report is to be issued, but the present report mentions the presence of an abundant and valuable flat fish fauna in Palk Bay. Later, an examination was made of Trincomalee Harbour, which had been reported to contain pearl oyster beds, but none could be discovered, except a few near York Island. Most of the sea bed consists of a very fine mud, which appears to be carried down by rivers, and is quite unsuited to the cultivation of oysters. An examination of Beligam Bay and Galle was made, and the latter place was found to be well protected from the south-west monsoon, and in many other respects well suited to the carrying out of experiments in cultivation on a large scale. Some trawling was done on the south-eastern coast, and considerable hauls of small but edible fish made. As a result of the investigations, Professor Herdman concludes that there are abundant healthy oysters, but the great majority are immature; secondly, they are so over-crowded that most will die before reaching maturity; thirdly, that the matter of transplanting can be readily carried out by means of dredging from a steamer and transporting in tanks of sea water from place to place; but the most suitable size of oyster and the best time of year (October or March) have yet to be settled.

The following table shows the names of the banks and the number of pearl oysters (*Avicula fucata*) estimated to be present when the inspection was made in March, 1902:—

Name of Bank.	Area of Bed in Square Yards.	Estimated Number of Oysters.	Nature of Oysters.
Cheval Paar (east)	11,804,676	74,413,000	Very good.
Cheval Paar (west)	10,500,050	125,357,000	Very good.
Moderagam Paar (north and south)	—	—	Young oysters.
Periya Paar Karrai	1,232,250	21,477,000	Very good.
Periya Paar	Very large.	—	Young oysters.
Karaitivu Paar	1,570,850	25,330,000	Very good.
Muttuvaratu Paar	10,206,725	277,000,000	Very good.

GENERAL NOTES.

COTTON CULTIVATION IN THE BRITISH EMPIRE.

The occasional shortages in the American supply of raw cotton, which have in recent years seriously affected the cotton manufacture of South Lancashire, have led to the formation of an "Association for the promotion of cotton cultivation within the Empire," with headquarters in Manchester. The objects of the Association are, in the first place, to collect all available information on the subject of cotton cultivation in British colonies and dependencies, and in the second to provide funds for the initiation of experiments under proper supervision in suitable localities, and for the distribution of seed to natives in districts where cotton cultivation is already well established. At a recent meeting of the Association the claims of India as a cotton-producing country were brought forward by Mr. S. M. Johnson, of Cawnpore, who stated that many varieties of the fibre were grown in India, from the short woolly variety found in Assam, to the long-staple cottons of Bombay and Southern India. The systems of cultivation at present employed, however, were of the most primitive character, and the improvements attempted had resulted in failure to produce a cotton suitable for export. Many attempts had been made to introduce the popular American and Egyptian cottons into India, but experiments of this kind were useless, the speaker considered, since there was no reason for supposing that these cottons were suitable for cultivation in India, and even if they were they did not represent the utmost which could be attained in the way of cotton-growing. He advocated rather the more careful cultivation of native cottons and judicious selection of seed from the best plants only, in order to improve the quantity and quality of fibre produced. When this stage had been reached it would then perhaps be advisable to import foreign seed, and attempt by hybridisation between the native and exotic varieties to improve upon both. Such experiments would be both tedious and expensive, and for their successful prosecution Government aid would be almost a necessity. Such aid, Mr. Johnson thought, planters would be justified in applying for, since the small experiments already made at Cawnpore (IMP. INST. JOURN., 1901, p. 273), were of a highly promising character, the out-turn of clean cotton of good quality being in excess of the usual American yield. The promotion of cotton planting would also be beneficial to planters who had been compelled to abandon indigo cultivation, and whose lands were now lying waste or were sub-let for the growth of unremunerative fodder-crops.

THE INFLUENCE OF LOW TEMPERATURES UPON BACTERIA.

Some experiments upon this subject conducted some time ago by Dr. Macfadyen, and recorded in this JOURNAL (Vol. VI., p. 182), showed that a number of typical representatives of saprophytic and parasitic organisms, possessing varying degrees of resistance, were able to withstand exposure to the temperature of liquid air (-190°C.) for seven days without undergoing any appreciable change in vitality, as evidenced by their subsequent growth, the production of their characteristic physiological properties and their pathogenicity. A severer test was afterwards made by exposure in liquid hydrogen at a temperature of about -252°C. for ten hours, but in this case also no effect upon the vitality could be detected. It must be concluded that at such low temperatures the chemical metabolism of the cell ceases, owing to the withdrawal of two of the necessary conditions—heat and moisture—and this being so it became of interest to test the influence of a long-continued exposure to such conditions. A series of experiments with this object have now been carried out by Dr. Macfadyen and Mr. Sydney Rowland, M.A., at the Jenner Institute of Preventive Medicine, and the results were communicated at the recent meeting of the British Association (Section K).

In these experiments, four organisms, viz., *Bacillus typhosus*, *Bacillus coli communis*, *Staphylococcus pyogenes aureus* and a *Saccharomyces*, have been maintained at the temperature of liquid air for a period of six months. The bacteria were suspended in small loops of platinum wire or on cotton-wool swabs, and were directly immersed in liquid air; the yeast, washed and pressed, was wrapped in rice paper and similarly treated. Samples were withdrawn and tested at intervals during the six months' immersion, but in no instance was any impairment of the vitality of the organisms detected. The yeast gave a good growth, and its fermentative powers were unaltered; the typhoid bacillus retained its pathogenic and other

properties; the *Staphylococcus* gave a characteristic pigment growth; and the *colon* bacillus responded to all the typical tests that were applied to it. Judging from the results obtained, it was concluded that the experiments might have been extended for a much longer period than six months without producing any appreciable effect upon the vitality.

These results are of great interest, for, as already stated, it must be assumed that at such low temperatures all the vital processes of the cell must absolutely cease, so that these organisms are capable of remaining in a state of entirely suspended animation for a period of six months, and perhaps much longer, without their vitality or characteristic properties being affected in any way.

THE CULTIVATION OF COLOMBIAN CASSAVA IN INDIA.

Acting on the advice and reports of Mr. Robert Thomson, who recently examined the methods adopted in Florida for the cultivation of economic plants (IMP. INST. JOURN., 1902, 239), the Director of Land Records and Agriculture, Bombay, has decided to commence the cultivation of Colombian cassava on the Government farms. He has been supplied with stems and cuttings, which, if carefully handled, will keep for some months, from varieties of cassava growing in different parts of Colombia. The experiment is being carried out mainly with the idea of providing a famine plant; although in Jamaica and Florida it is also used as a source of starch and as an excellent fattening food for cattle; from the starch is prepared tapioca and dextrine, and the manufacture of glucose is to be commenced.

Comparing it with corn, an acre of cassava producing six tons would yield 2,400 lb. of starch, whereas an acre of corn yielding forty bushels would only supply 1,187 lb. of starch.

It is superior to rice in growing well under varying climatic conditions, and requiring considerably less rain, a condition of great importance in India.

THE CULTIVATION OF COCOA IN AFRICA.

An industry which has been spreading during the last few years in several parts of Africa, and on some of the islands round the coast, is the cultivation of cocoa. The chief source at present is the Portuguese island of St. Thomas, and it appears that all the land suitable for the purpose is already occupied; at the same time several islands in the vicinity are being covered with plantations. The German Colony of the Cameroons, on the Western coast of Africa, ranks next, but practically the whole production is shipped to Hamburg; the following figures show the output during recent years:—

1892.	1895.	1897.	1898.	1899.	1900.
Bags, 900.	2,640.	5,400.	6,745.	9,047.	9,833.

It is expected that Madagascar, which has not completely recovered from the war with France, will become one of the most important sources of cocoa, the central portion and the eastern coast, especially round Tamatave, being highly suited to the industry. Complaints have from time to time been made that the German planters improve the outside appearance of the bean to the detriment of the "break," but that matter can be readily remedied.

AN INDIAN FAMINE FOOD.

At the request of the Reporter on Economic Products to the Government of India, Mr. A. Ghose has recently examined the seeds of the plant *Asphodelus tenuifolius*, belonging to the natural order *Liliaceæ* and indigenous to Northern India, where it is widely distributed. (*Agricultural Ledger* 7, 1902). The seeds, and occasionally the whole plant, have been eaten by the natives in famine times. The specimen of seeds analysed in the present instance contained approximately 26 per cent. of albumenoids, 17 per cent. of carbohydrates, and 25 per cent. of oil, the remainder being water, ash, and fibre. The nutrient ratio is not given. No alkaloid could be detected in the seeds. The oil was generally examined and found to have a saponification number of 108.7, and to possess drying properties, which were improved by admixture with metallic oxides. The seeds are employed medicinally by the natives, and are known to exert a diuretic action, a fact which requires to be borne in mind in connection with their use as a food.

LECTURES AND PAPERS.

"CONVICT LIFE IN SAKHALIN."

(By MR. C. W. HAWES.)

ANGLO-RUSSIAN LITERARY SOCIETY.

At a meeting of the Anglo-Russian Literary Society on Tuesday, October 7, Mr. F. W. Lawrence, M.A., of the *Echo*, took the chair at three o'clock, and Mr. C. W. Hawes, who had recently returned from Siberia, read a most interesting paper, illustrated by limelight and entitled "*Convict Life in Sakhalin*." Before entering upon his subject, Mr. Hawes spoke a few words about the penal system of Siberia generally. The prisons there were not all chambers of horrors as they had been represented by some writers, but neither were they pictures of Arcadian bliss as others would have us believe. It was quite certain, however, that the penal administration of Siberia, and indeed of the whole of Russia, was very much better than it was thirty or forty years ago. The abuses which continued to exist were due more to incompetent and immoral officials than to the system or to the measures of the Russian Government.

The Island of Sakhalin was discovered by the Japanese in 1613, but the Russians did not know it was an island till 1840. In 1858 the first batch of convicts was sent there. In 1875, Japan yielded her claim to its southern territory and received in lieu the Kurile Islands. It was in the autumn of last year that Mr. Hawes visited Sakhalin. He found it a most dismal place, peopled almost entirely by convicts, many of them desperate characters who were ready to kill a man for a few kopecks or a child for the value of its clothes. Houses were constantly being broken into and robbed, and it was necessary to be armed night and day. The servant in the house in which Mr. Hawes lived was a convict, who went to the prison every day to get his rations. Mr. Hawes' interpreter, a schoolmaster, was also a convict, and the landlady's son was murdered by an escaped prisoner during the lecturer's stay in the house. In fact the whole European population of the island, except a few commercial agents and, of course, the prison officials and the soldiers, were convicts or ex-convicts. Eight thousand of the prisoners were murderers, and a few were politicals, educated men and women. One woman whom Mr. Hawes saw there had been arrested at the age of nineteen for being mixed up in an affray at the time of the assassination of Alexander II. The prisoners were practically divided into three classes: the first of these consisted of the worst characters, and those whose sentences were just beginning who were confined (in idleness) in the "testing prison," two were still chained to wheelbarrows night and day; the second class consisted of the better behaved and less grave offenders, who worked in gangs, guarded by armed soldiers, while the third class lived in huts of their own, if married, outside the prison, or in barracks if they were single. They were entitled to the daily allowance of prison fare, consisting chiefly of salt fish and bread, and had to do a certain amount of allotted work during the year. Otherwise they were free to go about as they pleased, and to hire themselves out as labourers when they could. But the struggle to keep body and soul together in that terrible climate, with the difficulty of transport and the

scarcity of food, was very hard, and made the chance of ever leaving the island, still less of returning to Russia, even at the close of a sentence, quite hopeless, except in the rarest cases. The expenses and the difficulties of travelling were, of course, immense. The natives of the island were chiefly of Mongolian descent, but consisted of three distinct groups, inhabiting respectively the north, the middle, and the south of Sakhalin. Of these the last-named were by far the most civilized and intelligent. They all lived chiefly on fish, which they had great difficulty in getting in sufficient quantities. They travelled over the snow in sledges drawn by dogs. In this way the mail was brought to and from Alexandrovsk, the capital of the island. It was a most difficult and dangerous journey and only a native could manage it.

Mr. Hawes explained that, owing to the enormous distance between Sakhalin and the rest of the world (St. Petersburg was 5,000 miles away), supervision was difficult, and, as might easily be imagined, it was not by any means the best officials who were stationed in such an out-of-the-way and dismal place. And so it often happened that the officials themselves were guilty of offences quite as bad as those for which the prisoners in their charge had been convicted. The Russian Government, however, were taking steps to rectify this state of things, and the convict staff were to be tried for forgery, fraud and offences against the public morality.

In conclusion Mr. Hawes dwelt upon the one bright feature of this dismal picture—the work of Miss Eugenie de Meyer, the heroic ambassadress of the Imperial Charity Mission. She was sent, it was believed, by the Tzaritza's special wish, and her principal object, after giving immediate relief and establishing refugees on the Island, was to help time-expired exiles to get back to their homes.

Among those who spoke at the close of the lecture was Mr. Skrine, who dwelt upon the element of hope which he considered entered into the life of a Russian convict, but was conspicuous by its absence in our own system. Russian convicts were allowed to marry and set up house if they were well-behaved. This fact, in Mr. Skrine's opinion, seemed to imply an enlightened policy on the part of the Czar and his advisers, whose aim was less punishment than reform. The Governor of an English convict prison had told the speaker that a sentence of eighteen months' hard labour meant a complete and permanent breakdown in the case of an educated man.

Mrs. Ross drew attention to the fact that capital punishment did not exist in Russia: this explained the presence of the 8,000 murderers on the island.

Mr. Cazalet, the president of the Society, returned the hearty thanks of the meeting to the chairman who had so ably presided, and to Mr. Hawes for his intensely interesting paper. Mr. Cazalet thought that the reports of Captain Dreyfus and others showed that the penal system of France was not much better than that of Russia, while our own system was by no means perfect. We had a powerful check, however, in the existence of a free Press, and it might be hoped that the same advance might be made in Russia, thanks to the earnest desire of the present Czar to insist on justice and good administration being extended even to the most distant realms of his vast Empire.

PROCEEDINGS OF INSTITUTIONS.

THE ROYAL AGRICULTURAL SOCIETY OF ENGLAND.

The Council of this society reassembled on the 8th ult., for the first time since the autumn recess, the meeting being held a month earlier than usual with a view to expediting the arrangements for the holding of the society's first show on its new permanent ground in London from the 23rd to the 27th of next June. In the unavoidable absence of the President (THE PRINCE OF WALES), LORD CAWDOR was called to the chair.

The Hon. Cecil Parker brought up a further report from the Special Show Committee appointed on June 4 last "to consider the arrangements to be made for the show of 1903, with more particular reference to the general composition of the prize-sheet, the allocation of space to the several departments, the entry-fees to be paid for exhibits of live stock, machinery, etc., and the arrangements for the accommodation of visitors to the show."

On the motion of Mr. Sanday, seconded by Mr. Crutchley, it was resolved to invite the presidents of the several breed- and herd-book societies to a conference with a sub-committee of the Council on the afternoon of Monday, November 3, as to the classes to be offered for the breeds in which such societies are interested.

Sir Nigel Kingscote brought up a draft statement of the receipts and expenditure in connection with the society's meeting at Carlisle last July, which showed that the expenditure had exceeded the receipts by about £2,900.

Lord Brougham and Vaux moved the adoption of a report from the Botanical and Zoological Committee, which stated that the consulting botanist (Mr. W. Carruthers, F.R.S.) had paid a visit of inspection to the Woburn experimental farm, and had examined particularly the experiments with different varieties of English and American clover seeds, the grass plots, the plots devoted to experiments on finger-and-toe in turnips, and the potato plots sprayed with Bouillie Bordelaise. He had drawn particular attention to the instructive lesson to be derived from the appearance of the finger-and-toe experiments, in which the use of lime had had a most beneficial effect upon the crop. In the case of the potato experiments, the spraying treatment had saved the crop from potato disease to a very large extent.

Sir John Thorold presented a report made to the Veterinary Committee by Professor McFadyen, which stated that the published returns for the first nine months of the year showed that there had been reported 529 outbreaks of anthrax, with 841 animals attacked. These figures indicated that the disease was now more prevalent than at any time since it was first scheduled in 1887. The Veterinary Committee drew attention to the leaflet on anthrax which was circulated by the society, and which described the precautions which should be taken with a view to prevent the spread of this disease. The reported outbreaks for the past nine months of glanders numbered 886, and the animals attacked 1,597. The corresponding figures for last year were 1,047 and 1,799 respectively. During the same period 1,323 outbreaks of swine-fever had been reported, as against 2,795 outbreaks at the same date last year. Since the beginning of the year 12 cases of rabies in dogs and 11 in other animals had been reported. No case in dogs had been reported since the month of May last. The report further stated that, although the crops of acorns this year appeared to be light in many districts, and no case of acorn-poisoning had yet been reported to the laboratory at the Royal Veterinary College, it was desirable to call attention to the possibility of risks of this kind occurring during the next few weeks.

Communications having been received from the Sociedad Rural Argentina on the subject of the closing of English ports against live stock from the Argentine, a reply was, on the recommendation of the Veterinary Committee, ordered to be sent, stating that it was understood that communications, both formal and informal, were passing between the Argentine Government and the British Board of Agriculture, and expressing the hope that, by the action of the responsible authorities of both nations, a satisfactory solution of the difficulties to which the society's attention had been drawn might speedily be found.

The Hon. Cecil Parker reported that the examination in the science and practice of dairying had been held at the Reading College and British Dairy Institute from September 22 to 26, and at the Scottish Dairy Institute, Kilmarnock, from September 29 to October 3 last. Twenty-four candidates had been examined at Reading, of whom 11 had satisfied the examiners and were eligible to receive the national diploma in dairying. Sixteen candidates were examined at Kilmarnock, of whom 11 had succeeded in obtaining the diploma.

The committee reported that attention had been drawn to the code of regulations for dairy schools for 1902, in which the certificates of various agricultural societies and teaching bodies were stated to be recognised by the Board of Education as qualifying schools whose teachers possessed these certificates to grants for dairy work. The national diploma in dairying not being included among these certificates, the secretary had communicated with the Board of Education on the subject, and had received a reply, dated August 29, 1902, to the effect that in future the national diploma in dairying would be recognised as a sufficient qualification for the teaching of dairy work under the code.

Other business having been transacted, the Council adjourned until Wednesday the 5th inst.

The Council of the Royal Agricultural Society have now under consideration the composition of the prize-sheet for the society's first show to be held on its new permanent showyard in London in June, 1903. They contemplate that each established breed of horses, cattle, sheep, and pigs shall be represented in the showyard, and that classes and prizes shall be offered for such breeds by the society itself. But before proceeding further with the detailed consideration of the prize-sheet, the Council desires to have the benefit of the views of the representatives of the various breed societies as to the possibility of obtaining their support and co-operation in supplementing, from other sources, the prizes and classes which the society may find itself in a position to provide out of its own funds.

The Council suggest that it will be of advantage that there should be a conference between members of their body and representatives of the various breed societies, at which this matter can be fully and frankly discussed; and they have, therefore, appointed a sub-committee of their Stock Prizes Committee to meet any gentlemen representing the breed societies who may be able to attend at the offices at 2.30 p.m. on 3rd inst.

THE BRITISH ASSOCIATION.

During the recent meeting of the Association at Belfast, Captain C. H. D. RYDER, R.E., read a paper before the Geographical section on the province of Yun-nan. Sir THOMAS HOLDICH, the President, was in the chair.

Captain Ryder said that of the 18 provinces into which China proper was divided, Yun-nan, though one of the largest, was one of the least populated. It was one mass of hills with small plains nestling among them, in which resided the Chinese, who left most of the hilly country and the deeper valleys to the original inhabitants, such as Lolos, Shans, etc. There were some 70 walled cities, many of them cities only in name, each plain as a rule containing one city, the official centre of the district. From a geographical point of view the most interesting feature was the extraordinary number of large rivers which flowed through or rose within the province, affluents of the Iráwadi, the Salwin, Mekong, Yang-tse, West River, and Red River; the second, third and fourth of these, as they entered the Yun-nan, all flowed in deep valleys side by side for many miles, barely 20 miles one from another, with a large mountain range intervening.

Further south these rivers separated, allowing room for the head waters of the Red and West Rivers, the centre of the province, the watershed between these various river systems thus forming an elevated plateau, the plains on which were mostly about 6,000 feet in elevation. The climate varied according to the elevation from perpetual snow to perpetual heat, with every intervening stage; consequently the fauna and flora, and the produce of the fields, varied considerably. The seasons were well defined—rains, cold weather, and hot weather; the former the least pleasant, especially to travellers. Trade was nearly at a standstill owing to the shocking condition of the roads and the unhealthiness of the valleys, which were held in great awe by the Chinese merchants. The hills, except in the neighbourhood of the towns, were well wooded and abounded in small game, though the larger wild animals were conspicuous by their absence. A large quantity of minerals existed, mines of copper and silver—some worked, others deserted—being constantly met with.

Situated as it was in the south-west corner of the empire, with French territory on the south and English on the west, much attention had been drawn to Yun-nan, and after various schemes had been propounded for tapping the trade, the Yun-nan Company fitted out an expedition under Major Davis, to which the author was attached by the Government of India, to survey and report on Yun-nan, with a view to deciding whether a line of railway was possible from Burma into China. This was successfully accomplished in two successive seasons; but owing to the mountainous country and the poor prospects of traffic, it had been decided to abandon any idea of a railway on these lines. In a short time a railway would be completed, but it would be from Tongking and not from Burma. Yun-nan was, as regards scenery, the flower of China, and most pleasant to travel in, always excepting a certain rudeness, which everyone must expect, from the Chinese themselves.

The President, in thanking Captain Ryder for his paper, said that no country in the world illustrated better than that described in the paper the necessity for preliminary geographical survey before pushing forward commercial enterprise. All the schemes put forward for connecting India and China by railway were based on ignorance of the country, and they had to thank Captain Ryder and his colleagues for showing what the nature of the country was.

Mr. R. B. BUCKLEY contributed a paper on "Colonization and Irrigation in Uganda and the British East Africa Protectorate." Referring to the climatic conditions which affect Lake Victoria Nyanza, and the causes of the fluctuations in the lake, it was shown that the volume of water which is actually available for storage in the lake for purposes of irrigation is not so great as might be supposed.

The Uganda railway passed through the highlands of East Africa, where a tract of land, the size of England north of Liverpool and Sheffield, lay at an elevation of more than 5,000 feet above the sea, in a pleasant and temperate climate. There seemed to be no doubt that this country was eminently suited for colonization, and that, if it could be irrigated, nearly all European crops and fruits could be grown in it.

As to the possibilities of irrigation in East Africa, Mr. Buckley was not very hopeful. The three main rivers, he said, the Juba, the Tana, and the Sabaki, were not well known, and their discharges at different times of the year were not recorded. The rivers were navigable in their lower reaches near the sea. It seemed likely that irrigation from the Juba and Tana might be possible in the higher lands, and that 30,000 or 40,000 acres might be irrigated from the Sabaki, just below the point where the Tsavo river, which was fed from the snows of Kilimanjaro, joined the main stream. But the area commanded lies within the field of action of the tsetse fly, which might make cultivation difficult, if not impossible.

After discussing the possibility of irrigating the great Taru wilderness, which had absorbed so many human lives, Mr. Buckley pointed out that in the tract of land, lying about 5,000 feet above the sea, through which the Uganda railway passed, there were no rivers of any magnitude; and the discharge, in the streams which did exist, was very uncertain. He showed that the area which might be irrigated by the perennial discharge of those rivers which had a constant flow would be quite insignificant, and that the only way to irrigate effectively would be by the construction of reservoirs in the hills. These reservoirs would not probably be on a large scale, but would be formed by earthen banks across the valleys in which the streams ran. These embankments would be, probably, at intervals in the course of a stream, and farms of moderate size would be more or less dependent on each reservoir.

Artesian wells would be disappointing as sources of supply for irrigation, although they might give a valuable supply of water for cattle on the great grassy plains which abounded in

the temperate regions. The paper concluded with certain recommendations concerning investigations which appeared necessary before colonization, either by Europeans in the temperate tracts, or by natives of India in the less temperate areas, could be established with a good hope of success. Irrigation would, no doubt, be most valuable; but as yet it had not been proved that crops could not be successfully cultivated by the rainfall alone, if the cultivation was conducted with a due consideration of the local seasons.

In answer to questions from his audience, Mr. Buckley said he did not know that any very strenuous efforts had been made to induce the natives of the country to cultivate the land. As a matter of fact the natives were not an agricultural people; they lived entirely on animal food. Again, there were really not sufficient natives to cultivate more than a very minute portion of the country. Traffic on the railway at present was very slack indeed—he should think about one or two tons a day—but no doubt it would develop in time. The line was not likely to pay for a good many years, but there were many other important results that would follow the construction of the railway, which would prove a great deal more valuable to the Empire than the return of a few shillings per cent. on the capital expended.

The President, in offering the thanks of the meeting to Mr. Buckley, described the paper as a most interesting and important one. He trusted it would lead to a more complete examination of the sources of the rivers and their capabilities for irrigation.

COMMERCIAL INTELLIGENCE DEPARTMENT.

CORRESPONDENCE AND ENQUIRIES.

The following are given as specimens of some of the enquiries which have been addressed to, and satisfactorily answered by, the Institute during the past month (October).

* * All communications must be authenticated by the name and address of the writer. Enquiries which would involve special applications or expense will be a matter of arrangement with the correspondent.

R. M. & Co., Birmingham.—Planters of sugar, cocoa, and coffee in the West Indies, British Central Africa, Seychelles, etc.

F. B., Vienna.—Banana, cocoa and orange-planting in British Honduras.

J. H. B., N.B.—Where to obtain samples of certain kinds of marble.

W. A. L., Hastings.—Emigration to New Zealand.

G. L., Cheshire.—Publications on the commerce and industries of the Colonies.

M. C. A., Manchester.—Lists of cotton manufacturers on the Continent, in America, and the East.

V., London.—Mining in New Zealand.

P. A., London.—Cultivation and curing of tobacco.

REQUIREMENTS REGISTRY.

In order to provide correspondents with an opportunity of making known special "wants" or "needs" in the British Colonies, India, and Foreign Countries, space will be regularly devoted to the publication of approved notices in the IMPERIAL INSTITUTE JOURNAL. Notices, as a rule, should not exceed 25 words in length, for which a charge of 2s. 6d. will be made for each insertion. Special arrangements can be made for longer notices.

SPECIMENS OF FOREIGN AND COLONIAL WOODS desired. Purchase or exchange. Names and localities must be well authenticated. Address—HERBERT STONE, BRACEBRIDGE-STREET, BIRMINGHAM.

THE CURATOR OF THE CANADIAN SECTION OF THE IMPERIAL INSTITUTE is prepared to furnish information about Canadian Trade and to supply names of importers, manufacturers, shippers, etc.

The following trade enquiries have been received at the Canadian Section of the Imperial Institute, from the Curator of which Section further particulars may be obtained:—

Home Enquiries.—A Liverpool house asks to be placed in communication with Canadian manufacturers of birch squares and other chair parts, also drawer bottoms.

A London firm desires names of Canadian shippers of soapstone of best quality.

A Midlands firm possessing a large connection in box shooks would like to hear from Canadian manufacturers who can supply same in quantity.

A London firm desires names of Canadian manufacturers of boots and shoes producing only ladies' goods.

Canadian Enquiry.—A Canadian manufacturer of bicycles asks to be placed in communication with United Kingdom firms prepared to take up the sale of his machines.

Foreign Enquiry.—A British house in Japan desires to arrange with a Canadian firm of good standing to deal with various druggists' goods which they supply.

CEMENT IN THE UNITED STATES.

In the latest report of the Ontario Bureau of Mines for 1902, the following interesting observations are given respecting the production and uses of cement in the United States:—Cement is classed among materials of construction, but its use is by no means confined to buildings in the ordinary sense of the term. The employment of cement has of late years been extending in a multitude of directions, and it has been found capable of satisfactorily replacing not only clay products and stone, but also wood and iron for many purposes. In almost every variety of public works, such as canals, dams, breakwaters, piers, bridges, conduits, etc., cement plays a highly important part, and in the composition of buildings it is no longer restricted to foundations or floors, but finds much favour with architects, especially in large modern steel and iron structures, as a substance for imbedding beams and girders to give additional strength, prevent oxidation, and guard against the destructive effects of warping in case of fire. In the construction of highly specialized edifices such as grain storehouses, the durability and imperviousness to moisture of cement walls renders it very useful. The lead in using cement for storehouses has been taken by builders in some of the countries of Continental Europe. But recently a huge elevator was put up for the late P. H. Peavey at Duluth, Minn., capable of holding 6,200,000 bushels of grain, on the "concrete and wire mesh system with steel tie rods as an additional strengthening," absolutely no wood whatever being used in the building. The grain is stored in 50 bins or tanks, of which 30 are circular, the others occupying the interspaces between the circles. In one half of the building the concrete walls, which vary from eight to twelve inches in thickness and are 104 feet high, are strengthened by 1½ by ½ inch flat bands placed horizontally and spaced eight inches apart. In the other half these straps are supplemented by a system of steel wire built into the concrete as a steel mesh. The concrete used was ordinary Portland of a leading brand, mixed in the usual way and by machinery.

The structure is considered fireproof, and no insurance is carried upon it. For roofing, tiles, sewer pipes, culverts, for decorative and art purposes, for the manufacture of hollow building blocks to take the place of brick or stone, for the foundation of bank barns and for a hundred other uses, cement is rapidly winning its way. One of the most noticeable methods of its employment is in the cement or "granolithic" sidewalks which are becoming so common in the cities, towns, and villages of Ontario. In nothing is the march of improvement showing itself more in the smaller places of the province than in the increased care which is taken with the streets and sidewalks, and within the last three or four years many

thousands of dollars have been spent in laying down permanent walks and pavements of which the leading material was cement.

A natural consequence of the increased use of cement has been a very marked stimulus to its manufacture. It is doubtful whether any other staple industry in the United States, not even excepting that of iron and steel, in which there has been phenomenal growth, can show a record of equal expansion. In 1890 the production of cement in that country was 335,500 barrels, in 1899 it was 5,652,266 barrels, and in 1900, 8,482,020 barrels. To supply the demand in the last-named year there were also imported into the States, mainly from Germany, Belgium and England, 2,836,683 barrels, a quantity equal to the entire native production in 1897. From 1890 to 1900 the average rate of increase from year to year in the manufacture of cement in the United States was 40 per cent., and the output of 1901 will show no diminution in the ratio of growth.

The chief centres of cement manufacture on the other side are Pennsylvania and New Jersey, which together contributed about five-sevenths of the aggregate production in 1900, but rapid strides are being made by Illinois and Michigan. In the latter State, indeed, there has been a veritable cement "boom." Nine factories are operated and five more were under construction in 1900, while an almost countless number were being projected. Marl is abundant everywhere, and nearly every lake and marsh in the State are underlain by it.

Competition with cements imported from the United States is complained of by some of the Canadian manufacturers, who state also that this had the effect of curtailing last year's output of the native article. The immense strides which the industry has made on the other side of the line have probably, in a measure at least, overtaken the demand and produced a surplus for which a market is now being sought in foreign countries. Trade statistics do not bear out the impression that the Canadian market is fully supplied by home-made cement; indeed, they show conclusively that such is not the case. For instance, while the imports of cement into Canada for the twelve months ending 30th June, 1900, amounted to 1,312,170 cwt., worth \$520,593, exclusive of duty, \$151,075, for the twelve months ending 30th June, 1901, they rose to 1,614,666 cwt., worth \$675,768, or adding \$183,198 duty, to \$858,966. The countries from which the imports were made, were:—

Great Britain	\$230,584
United States	228,845
Belgium	142,936
France	2,787
Germany	70,170
Other Countries	446
Total	\$675,768

During the preceding twelve months the United States exported to Canada 55,569 barrels only, so that a very considerable increase took place in the importations from that country. Subsequent statistics show that supplies of cement are now coming into Canada from the United States at a highly accelerated rate. For the seven months ending 31st January, 1902, the total import of cement amounted to \$610,041, of which the United States furnished no less than \$501,014, thus leaving Great Britain, Germany and Belgium far in the rear. So long as the requirements of Canada are not met by the products of her own factories, so long is there a possibility of increased sales for Canadian makers, and the reduction in price, while far from being an agreeable feature, may, in the natural order of things, be expected to lead to greater consumption. It will be the part of wisdom for those interested in or proposing to become interested in the manufacture of cement in Ontario to study well the conditions which prevail at home and abroad, with the view of avoiding over-production and its consequent demoralization of markets and values.

In a recent official review of the cement industry of the United States, Mr. Spencer B. Newberry, after referring to the remarkable expansion of cement-making in that country during the past few years, utters the following warning:—

"It is to be feared, however, that factories are being established and extended with little consideration of the probable future condition of the market. For ten years each year has witnessed an increased consumption of Portland cement almost exactly equal to the increased output of our factories. It is hardly to be expected that this advance in demand can continue as in the past at constantly increasing speed. The least check in the extension of the applications of cement, or a year in which the amount used is only equal to that of the previous year, will bring about a sudden and immense over-production, with great disaster to the smaller and less favourably situated manufacturers. Whether this will take place next year or the year following can only be conjectured; it is certain, however, that the day of keen competition among American producers is not far distant."

The Bureau Report says that "when the day arrives of which Mr. Newberry speaks, not the least to feel the effects will be the manufacturers of Ontario, whose market is close to the great cement plants of the United States, and who may have to meet prices on a lower plane than any they have yet seen. But there is no reason why, with the advantages of modern plants, cheapness of raw material and lighter freights in their favour, not to mention a tariff duty of 12½ cents per 100 pounds, the skilled business men who own and manage the cement works of Ontario, should not find themselves as well equipped for a period of over-production and reduced profits, should such a period come, as their competitors in the United States."

MINERAL PRODUCTION IN INDIA.

The following is a summary of the statistics of mineral production in India in the ten years 1892 to 1901, compiled under the supervision of the Director General of Statistics, Mr. J. E. O'Connor:—

SALT.—The production of salt in India averages about a million tons annually, fluctuating from time to time with the seasons. Last year the production was 1,190,000 tons. In 1900 the production at the Sambhar Lake was extremely small, but with a better season manufacture in 1901 was very active. The largest proportion of the salt produced in India is, however, sea salt made on the coast, in Sind, Bombay, Madras, Burma, and at Aden. The quantity so made on the Indian coasts in 1901 represented two-thirds of the whole production.

COAL.—This industry is expanding so rapidly from year to year that a statement of the average production over a series of years would not convey a true idea of the conditions. The output has increased from 3,540,000 tons in 1895 to 6,636,000 tons in 1901. Coal is found of varying quality over a very extensive area of the Indian region. At present the principal mines are located in the Raniganj district in Bengal, at Singareni in the Nizam's territory, at the Lakhimpur district in Upper Assam, at Mohpani and Warora in the Central Provinces, and at Umaria in the Central Indian Agency.

Indian coal is now extensively, in some places exclusively, employed for the railways, coasting and river steamers, mills and factories; but, as in the case of salt, the conditions of transport are not yet sufficiently developed, though they are being greatly improved, to permit of the exclusive use of Indian coal for industrial purposes. The quantity of Indian coal used in India is therefore supplemented by an importation which has averaged 280,000 tons annually in the last five years. Imported coal is mostly landed in Bombay, the mills in that place requiring large quantities of fuel and being too remote from the Indian sources of supply to find the use of Indian coal economical, having regard to the easy

conditions on which steamers carry coal to India as freight. Most of the imported coal is English, a small quantity being received also from Japan.

GOLD.—Gold is produced mostly in the mines of the Kolar district in Mysore, where the annual output now exceeds half-a-million ounces. From the mines in the Nizam's territory only a small quantity has been extracted as yet. No account is taken in these tables of the gold produced in parts of Northern India from the washings of river sands; it is well known that it is entirely insignificant, but there are no means of stating the quantity statistically.

The aggregate reported production is 531,766 ounces, the value of which may be taken to represent, at £4 an ounce, about two millions sterling. It is all shipped to London.

PETROLEUM.—The production, which is confined to Burma and Assam, amounted to 50 million gallons in 1901, more than 49 million gallons being of Burman production. Although the production has expanded very largely, it is still insufficient for the requirements of the Indian market, which are met by the importation of some 81 million gallons from the United States and Russia. The exports of Burma petroleum last year were:—

To foreign countries	35,241 gallons
„ Indian ports	18,688,009 „

It should be borne in mind, however, that the Indian production is stated in terms of crude petroleum, while the imports consist of kerosene and lubricating oil.

SALTPETRE.—This article, which is largely produced for export, was in former years of much greater importance than now, the decline in demand for gunpowder and the preservation of food, with the competition of the nitrates, having operated to prevent an expansion of the exports. It is most largely produced in Bihar, whence the article is sent to Calcutta for export after refinement. The average production is stated to amount to only about 251,000 cwt., of which 209,000 cwt. are reported to have been made in Bengal—that is, in Bihar. But the production is grossly understated, for the average annual exports of refined saltpetre from Calcutta in the last five years have amounted to 370,398 cwt., and this represents a much larger quantity of crude saltpetre.

IRON.—The production of iron is as yet quite in its infancy, the ore being worked for the most part only in the Raniganj district of Bengal, where it occurs in close proximity to the coalfields. According to the figures which, however, are of doubtful accuracy, the production in 1900 amounted to only 63,000 tons, of which 57,000 tons were produced in Raniganj. For the adequate utilization of the iron ores of Bengal and other parts of India the application of very large capital is necessary for the manufacture of wrought iron and steel in the forms in which these metals are mainly used in India, and the prospects of such an enterprise have not hitherto seemed sufficiently decided to induce capitalists to venture on the sinking of the great sums of money required for work on the extensive scale which alone would be remunerative.

GRAPHITE (PLUMBAGO).—In the State of Travancore there are four mines from which graphite was extracted in 1901-02 to the amount of 2,490 tons. No information has been given of the quality of the graphite. It is doubtless exported, but no particulars of the trade have been furnished, nor are the capabilities of the mines known.

OTHER MINERALS.—These are relatively of small economic importance, manganese ore, mica, and tin ore alone being of commercial importance. The production of manganese commenced a few years ago, the product being shipped to England. It is all exported, but it does not seem to be a quickly expanding trade; the exports last year were 133,170 tons. The extraction of mica has been an industry in Bengal for a considerable period, and recently this mineral has been worked in Madras in some quantity. This is also mainly exported, the exports last year being 815 tons. Tin-mining has been carried on for many years by Chinese in Lower Burma, but their operations have not indicated any tendency to expand, and the trade is trifling. It is practically all used in India.

The following table shows the quantity and value of the principal minerals produced in India in the year 1901, as compared with the figures for the preceding year:—

	Quantity		Value.	
	1900.	1901.	1900.	1901.
			Rs.	Rs.
Salt Tons	1,005,022	1,102,546	45,78,295	56,22,728
Coal „	6,118,692	6,635,727	2,01,46,222	1,98,50,582
Gold Ozs.	513,266	531,766	2,83,77,063	2,89,61,061
Petroleum Galls.	37,729,211	50,975,117	22,31,325	30,65,131
Manganese ore Tons	130,670*	133,170*	12,51,639*	14,37,858*
Mica „	435½	1,138	4,17,212	9,95,892
Tin ore „	104	70	1,28,009	1,16,595

* Exports from India in the financial year ended 31st March, the figures of production not being available.

AGRICULTURAL RESOURCES OF THE SEYCHELLES ISLANDS.

In the latest report of the Administrator of the Seychelles Islands, a carefully prepared and interesting account by Mr. R. Dupont, the Curator of the Botanic Station, is given of the work of the station during the past year and the agricultural capabilities of these islands. Mr. Dupont says:—

"With regard to the manuring of the soil, it is very fortunate that, in a granitic country like Seychelles, guano deposits are found in many of its islands. This guano constitutes at the same time a mineral wealth of the colony. The deposits are almost invariably ancient, and guano beds are in process of formation only in distant islands where immense flocks of birds are still to be found. On many islands the guano is found in dusty layers on the surface of the soil. This surface guano is dark in colour, especially when it is moist. There are numerous tints which vary between yellowish brown and reddish black. The lighter-coloured guanos are richer in phosphoric acid, and the dark ones are full of organic matters which increase the percentage of nitrogen. All this surface guano is now more or less mixed with vegetable decay.

"Under the action of rain, and in presence of the carbonic acid of the atmosphere, the phosphates of lime are dissolved and sink through into the soil, displacing the carbonates of lime where the island is madreporic, thus forming a second layer of mineral guano, which is generally lighter in colour, and the richness of which in phosphoric acid reaches, and even exceeds, that of the surface guano. Where the island is granitic, and more clay is mixed with the guano deposits, the phosphates of lime in a soluble state take the place of the silicate of alumina, and a phosphate of alumina is formed. Sometimes the transformation of phosphate of lime into phosphate of alumina is complete, and no molecule of phosphate of lime remains undecomposed.

"Even the granite rocks which are found in the sub-soils of some islands are attacked by the solution of phosphate of lime; and when the surface of these rocks is analysed to an inch or more in depth it is found that all the phosphate of lime has penetrated and

transformed the rock, which sometimes contains as much as 25 per cent. of phosphate of alumina.

"All these different phosphates originating from the guano deposits are found in immense quantities, which I estimate as over several hundreds of thousands of tons. On the same island very different kinds of guano deposits are found, and scientific investigations are rendered necessary when the extraction of guano is started.

"Some of the guanos are exported to Mauritius, South Africa, and Europe, and, as the phosphoric acid they contain is very soluble in citrate of ammonia, they are much appreciated everywhere. When they contain less than 20 per cent. of phosphoric acid they are very seldom exported on account of their not being able to bear the cost of freight, as the price they fetch depends on the quantity of phosphates they contain. These poor guanos remaining in Seychelles will always form an important reserve for the agricultural development of the colony.

"Another source of manure is to be found in the deposits of seaweed which are washed up in some places during the N.W. monsoon, and in others during the S.E. monsoon. The component parts of these weeds very nearly approach those of good farm manure, but with a greater percentage of potash, and it is well known what wonderful effects they produce in the cultivation of granitic countries like the coast of Brittany in France.

"It is rather surprising that, notwithstanding a good climate, and so many sources of manure, agriculture in Seychelles seems to be in a backward state. This is due no doubt to absence of capital, and to the abnormally high rate of interest at which alone the planter is able to secure advances. If means could be adopted of obtaining capital at reasonable rates to help the planters, the present industries of the island would, in a short time, be extended, whilst others would be established.

"Again, owing partly to absence of capital, labour is very scarce in Seychelles. Many labourers have been employed by the poorer proprietors as "metayers," and the result is that it is now very difficult to rely on the former labourers, who, having become half proprietors, naturally look askance at the less lucrative hire system.

"The labourer of Seychelles is a negro of fine physique, and it is a pity to see him avoiding situations for which he is admirably fitted. The necessity of importing labourers is now becoming urgent, and the only countries from which reliable emigrants can be obtained are India and Ceylon.

"A fully representative committee was appointed at the end of 1900 to enquire into the question of the scarcity of labour, but no practical solution of the question has so far been arrived at, as planters are unwilling to import labourers unless the entire cost of their introduction is borne by the Government."

THE EAST AFRICA PROTECTORATE.

The report of the Chief of the Customs on the trade and Customs' revenue of the East Africa Protectorate for the year ended March 31 last has just been issued by the Foreign Office. Owing to special and temporary causes, both revenue and trade have fallen. Trade at Mombasa is in a sounder condition than it has been for years past, for a number of smaller merchants who were trading on narrow margins and long credits have gone. India sends a third of the imports, the United Kingdom 27, Germany 11, and the United States 6 per cent. The American share of the trade would be larger but that Russian kerosene has been underselling that from the United States. The imports of fruit and vegetables have declined, because the Protectorate now produces its own and will probably soon export them to South Africa. As to the Uganda Railway, Mr. Marsden says that, although the rails reached Lake Victoria in December last, there is still a year's work to do in constructing bridges and laying the permanent way. Two steamers are being built to take the traffic from the centre of Uganda across Lake Victoria to Port Florence, the terminus of the line, and it will depend on the through rates charged whether exporters will find it worth while to send their products to the coast. "Merchants and others who have travelled in Uganda speak in the highest terms of the possibilities of raising crops, and of the cultivation of coffee and rubber, but fear that the present freight charges will act as a deterrent to their being exported in any volume." The total imports last year amounted to just over £421,000, the largest in any previous year having been £468,000. Piece-goods formed more than a quarter of the whole, and various foodstuffs about the same. The exports were £113,200, of which ivory formed more than half and grain a fifth. The piece-goods trade has gone on steadily increasing, even in years when the total imports showed a decline. This is said to be a sure indication of the development of the country and of the desire of the natives to clothe themselves in something other than feathers and skins. The first case of plague appeared on February 28 in Nairobi, the headquarters of the Uganda Railway, 330 miles from the coast, but, stringent precautions being taken, it was confined to that town, and speedily stamped out. Owing to the coast towns being kept free from plague there was no interruption of shipping business, but the traders in Nairobi in some cases suffered considerably, through cessation of their business and the destruction of their property, though it is expected that, in the latter case, reasonable compensation will be made by the Administration. The bazaar has been moved to a more healthy site, and the buildings in the infected area, where the bazaar formerly stood, have been destroyed by fire.

JOHORE.

The following particulars respecting the State of Johore have recently been received from the Corresponding Agent of the Institute, the Hon. Dato James Meldrum:—

JOHORE.—The Singapore-Johore Railway, 14 miles, may be finished this year. More money has been applied for. More than a million-and-a-half of dollars will have been expended on this narrow gauge line ere it is completed. The line through Johore to connect with the flourishing railways of the Federated Malay States is not yet begun.

The Royal Johore Tin Mining Company, Limited, at an extraordinary meeting of the shareholders in Singapore, declared an interim dividend of \$5 per cent.—50 cents per share. After paying the dividend, from \$6,000 to \$7,000 would be carried forward towards next dividend. There was \$35,000 on fixed deposit and \$27,800 in current account at the Bank, besides about \$4,500 more for tin on hand in Singapore on which advances have been paid, but the proceeds not yet received.

With regard to the land, the chairman said they had a quantity, certainly enough for two or three years to come. The Sultan of Johore had been approached by the Company with a view to his granting them a circle of 2½ miles wide all round their present boundaries. The Sultan, however, wants the Company to pay the cost of surveying the land. The \$10 shares are now at \$4½ only.

Tin is quoted at \$81.50 per picul of 133½ lb.; gambier, the staple product of Johore, \$14.12; black pepper, \$32. The cultivation of those articles is entirely in the hands of the Chinese; they also get the tin ore. Prices are greatly regulated by the cost of rice; at present, Rangoon white rice costs \$154 per coyan of 40 piculs; Siam No. 1, \$190.

Owing to the great scarcity of water in Singapore at present, the Tanjong Pagar Dock Company, Limited, has obtained some from here, with the Sultan's permission. There are no artesian wells in this part of the world.

The decimal system prevails all over the Far East, and helps immensely to facilitate trade and to render the arithmetical education of the young and the ignorant easy. Its

adaptation for the purposes of trade is immense; our complicated system of weights and measures, etc., would never answer here, trade would be frustrated thereby, and be seriously hampered, and others who use the decimal system have the advantage over us.

TURKS AND CAICOS ISLANDS.

The Commissioner of the Turks and Caicos Islands concludes his report for the past year by a comparison of the condition of the islands 50 years ago and now. In 1852, the population was 3,260, the total revenue £10,690, and the expenditure £10,370; the imports were £29,460, and the exports £22,166, which consisted almost wholly of salt, the export of this article being 1,061,776 bushels, valued at £22,034. Twenty five years later, the population had increased to 4,723, and the revenue and expenditure had been reduced to a little over £7,000, because, in the meantime, at the request of the people, the separate administration of the colony was given up and it was placed under Jamaica, by which considerable economies were effected. Imports fell to £22,900, and exports increased to £26,700, of which £23,000 was the value of 1,641,384 bushels of salt sent abroad. To-day the condition of the colony is very satisfactory. Without increase of taxation, and even with a reduced tariff, the revenue has gone up to £9,000; the expenditure is £8,000; the imports have increased to over £30,000 and the exports to just on £40,000, of which £22,780 was the value of nearly 1¼ millions of bushels of salt. The United States absorbs the bulk of the trade, as in 1852; the total value of the salt exported, in spite of a great fall in price, remains much the same; but it no longer forms about 99 per cent. of the exports, for though the colony continues to owe its existence to the salt industry, it has been reinforced by the sponge and fibre industries. Twenty-five years ago the export of sponges was about £100; 10 years ago it was £600; last year it had reached £9,277. There are three sponge establishments on the Caicos Islands, where the sponge is gathered on the banks and finds a ready sale in the United States, though not of the quality of the Mediterranean sponge. Fibre is also a recent industry; in 1890 the value of the export was £49; last year it was £6,551. The salt is produced from sea water by solar evaporation in the Turks Islands, and is the sole industry there, for the absence of rain for weeks, the hot dry wind (which renders the production of salt possible), and the sandy soil prevent any cultivation; but in the Caicos the conditions are more favourable. Here two large fibre plantations have been formed, and are extending their acreage. There are still some thousands of acres suitable for the industry, which in three or four years would give a fair return on the money invested, so long as the present price of the fibre is maintained.

NEW BOOKS, etc.

L. K. CAMERON. (Toronto, 1902.)

Eleventh Report of the Bureau of Mines, 1902. THOS. W. GIBSON, Director. Printed by order of the Legislative Assembly of Ontario. With maps. La. 8vo., pp. 309.

This useful report contains a record of the progress of the mining industry in the Province of Ontario up to the date of issue. The statistics of mineral production are for the calendar year 1901, but those relating to metalliferous products for the first quarter of 1902, having been collected while the report was in press, are also given. The information will be most useful to those engaged in the business of mining as prospectors, miners or mine owners, as well as to promoters and capitalists. The work of the Geological Survey of Canada and of the Ontario Bureau of Mines has resulted in the accumulation of much useful knowledge respecting the geology of the accessible portions of the Province, and in various districts the way has been cleared for more detailed examination and the tracing out of mineral-bearing formations or known mineral belts. The results of these labours have been published yearly in the reports of the Bureau. With the development of the Province, the operations of the Bureau increase and multiply. The opening up of new or Northern Ontario is a question now occupying the public mind, and that there is great mineral wealth in this region can no longer be doubted. Professor A. P. Coleman has been engaged during the past year in exploring the Iron Ranges of North-Western Ontario, and contributes a report thereon as well as a study of the Syenites of Coldwell. The important metallurgical and mineral industries established at Sault Ste. Marie by the Clergue companies are fully described by Professor A. B. Willmott. Professor Miller has examined the Eastern Ontario Gold Belt, and the mineral resources of Nipissing district, and the results of his investigation are given in this present report, together with geological maps. Mr. I. W. Wells has written a paper on "Arsenic in Ontario," containing much information on the mispickel deposits in the Province and the industry growing up therefrom, which is likely to become important. The exhibit of Ontario minerals at the Pan-American Exposition held at Buffalo, N.Y., last year, is described by Mr. Frank N. Speller, Superintendent of the Exhibit, and the Rev. Thomas Nattress of Amherstburg supplies a brief description of the Corniferous rocks as exposed in the quarries of Anderdon township, Essex county. Mr. W. E. H. Carter, the Secretary of the Bureau, has also given a full report of his inspection of the mines throughout the Province.

EYRE AND SPOTTISWOODE. (London, 1902.)

The Founding of Fort St. George, Madras. By WILLIAM FOSTER. Published by order of His Majesty's Secretary of State for India in Council. 8vo., pp. iv. + 113. (Price, 1s.)

This small brochure, which is an official publication, has been compiled from hitherto unpublished extracts from the India Office records, and supplies materials for writing an account of the establishment of the settlement of Madras and its history under Hindu rule. The early history of Madras has not been fully written, there being many blanks, and a number of doubtful statements in the books published on the subject. The author of this pamphlet says in his preface that the collections from which the extracts have been drawn—the most important of which is that known as the *Original Correspondence* (O.C.) Series—are by no means as complete as could be wished. Many important letters have perished entirely; of others only portions survive, often in very unlikely quarters; while several events of the first importance are merely referred to obliquely in the contemporary correspondence. Such as they are, however, the extracts are believed to reflect fairly all the information of importance which it is now possible to glean from the records of the East India Company. It was at first intended to confine these extracts to the actual founding of the Fort, but the necessity of dealing with the well-known story of Sri Ranga's grant carried the narrative forward to 1645, and it then seemed advisable to go on to the conquest of the district by the Golconda troops two years later. The extracts are connected by explanatory notes, so as to form in some sort a continuous narrative. The quaint spelling of the Company's factors and agents is very amusing, and their letters give many interesting details respecting their dealings with the natives and their rulers. The record of a consultation at Fort St. George on the 29th December, 1642, notes that—"The warrs and broyls increasing in this Country, and now by reason of our great nauque's imprisonment drawing nere to us, wee latelie raised a third Bulwarke of turfe; and wanting Gunns to mount thereon, have resolved that the *Advice* shall spare us foure Minion for that purpose." The tenacity and sturdiness of the founders of Fort St. George led to the successful establishment of the Government at Madras, and greatly influenced the future of the settlement.

W. AND R. CHAMBERS, LIMITED (London and Edinburgh, 1902.)

The Progress of New Zealand in the Century. By R. F. IRVINE, M.A., and O. T. J. ALPERS, M.A. 8vo., pp. xviii + 460. (Price, 5s. net.)

The authors of this volume have produced a very interesting and complete account of the progress of New Zealand, "the fortunate isles," during the past century. Part I., which deals with the history of New Zealand up to the year 1870, has been written by Mr. Irvine, who begins with a description of the Maoris and their migration from Hawaiki. The manners, customs, and religion of this singular

race are well described, and also the *pukcha* Maoris, or runaway white sailors, who were the first pioneers on the islands. Mr. Irvine, the author, gives much praise to the work of the missionaries among the Maoris in the introduction and spread of Christianity. The administrations of Sir George Grey as Governor and the subjugation of the Maoris are well described, and the progress of New Zealand under provincial government is reviewed. Part II. gives an account of the events and legislation subsequent to 1870, and has been written by Mr. Alpers. The experiments that have been made in legislation have been numerous, and daring. The extension of the franchise to women in 1893, is an example of the advanced ideas that prevail in the "New Democracy." The chapter on the labour laws of New Zealand will be found interesting, as showing the effects of the Act passed in 1894 to encourage the formation of industrial unions and associations, and to facilitate the settlement of industrial disputes by conciliation and arbitration. The progress of land settlement, education, art, science and literature are dealt with, concluding with a statistical appendix showing the rapid development of the wealth and resources of these favoured islands.

C. ARTHUR PEARSON, LIMITED (London, 1902). *Among Swamps and Giants in Equatorial Africa; an Account of Adventures in the Southern Sudan and British East Africa.* By Major H. H. AUSTIN, C.M.G., D.S.O., R.E., F.R.G.S. With two maps and many illustrations. Cr. 8vo., pp. 354. (Price, 15s. net.) Equatorial Africa is the darkest portion of the "Dark Continent," and though many portions of it are now known geographically, yet there is still much to be learnt respecting it. Major Austin's book is a record of two journeys across the land of swamps and deserts; the first of these was a surveying expedition in 1899-1900, when the author, accompanied by Lieut. Bright, made a survey of the Lobat region. The second journey in 1900-1901 from Omdurman to Mombasa, in East Africa, via Lake Rudolf, was full of hardships and adventures, which are related in a graphic style, though Major Austin says that he has purposely toned down some of the harrowing details which were found in his diary. The exploring party came into contact with savage hordes of hostile Turkana, a gigantic race averaging six feet in height, inhabiting the country bordering and south of Lake Rudolf. The author and his two comrades barely escaped with their lives, and of the 59 Sudanese who formed their escort only 14 survived, the majority dying for want of proper sustenance. This speaks much for the endurance and courage of the Egyptian soldier. The illustrations inserted in the book are from photographs, and add greatly to its interest. The natives appear to have offered no objection to being photographed, so that many excellent views were taken.

CASSELL AND COMPANY, LIMITED (London, 1902). *Aconcagua and Tierra del Fuego, a Book of Climbing, Travel and Exploration.* By Sir MARTIN CONWAY, President of the Alpine Club, late Professor of Fine Art in the University of Cambridge. With 27 illustrations and a map. Cr. 8vo., pp. viii+252. (Price, 12s. 6d. net.) Sir Martin Conway has had thirty years of climbing, during which he has performed many arduous and dangerous feats, but perhaps none has excelled the ascent of Aconcagua, the culminating peak of the Andes, which he made in December, 1898. Accompanied by an Alpine guide, the author made the ascent, in spite of its difficulties, without accident. The description given in his book is most interesting, and conveys an excellent idea of this wild region. This ascent was followed by a journey to Tierra del Fuego and an exploration of Mount Sarmiento. The book is well illustrated with numerous photographic views of the scenery of this desolate land: those taken from the summit of Aconcagua are remarkably picturesque and striking. As a record of travel the volume will be found very attractive, being written in a pleasing and agreeable style.

HUSSEY AND GILLINGHAM. (Adelaide, South Australia, 1901). *History of Adelaide and Vicinity, with a general sketch of the province of South Australia, and biographies of representative men.* Edited by J. J. PASCOE. Roy. 4to., pp. 710. Illustrated. (Price, £3. 10s. net.) This work, as stated in the preface, is "an authentic record of the early endeavours, sturdy struggles, and patient perseverance of the pioneers of the Province during its childhood; of the agricultural achievements, commercial courage, exploring enterprise, legislative labours, and pastoral progress during its youth; and of the indefatigable industry, great generosity, financial failures, rapid recoveries and enduring energy of its early manhood." It describes the period of South Australian history from its commencement as a British colony under King William IV., its gradual growth under the benign reign of Queen Victoria, down to its entrance as a State into the Commonwealth of Australia under King Edward VII. The description of the founding of Adelaide by Colonel Light in 1836 is most interesting. The second half of the book is devoted to interesting biographies of the men of note whose names are most closely associated with the political, moral, and general progress of South Australia. In an appendix at the end of the book will be found some excellent notes on the constitution of South Australia, written by the Hon. Sir R. C. Baker, President of the Legislative Council. The volume is beautifully illustrated with photogravures executed in the best artistic style, especially the numerous portraits which are given; the printing and binding are all that could be wished, and the work forms a most valuable and handsome addition to the literature of Australia.

STATISTICAL NOTES.

Tea Statistics.—The annual consumption of tea in the most important markets of the world, for the three years 1898-1900, is shown in the following table, taken from Gow, Wilson and Stanton's Tea Report; and supplied mainly by the Intelligence Branch of the Commercial Department, Board of Trade:—

ANNUAL CONSUMPTION OF TEA IN ENGLISH POUNDS.

COUNTRIES.	1898.	1899.	1900.	Approx. duty per English lb.
	Lb.	Lb.	Lb.	
Australia	25,601,773	27,347,192	28,122,969	Free.
New Zealand	4,721,000	4,799,000	5,175,000	2d.
Tasmania	1,012,277	1,077,632	1,143,094	Free.
Great Britain	235,414,000	242,561,000	249,792,000	6d.
Newfoundland	873,386	1,031,652	949,612	33% ad val.
Canada	19,955,000	25,056,000	24,568,000	{ free from country of production and U.K., otherwise 10%
U. S. America	67,697,000	72,836,000	83,303,000	5d.
Holland	7,040,000	7,073,000	7,665,000	2½d.
Cape Colony	2,781,528	2,117,471	3,327,221	6d.
Natal	434,718	484,486	410,390	6d.
Russia	107,820,000	104,436,000	125,784,000	8d.-1s. 10½d
Denmark	1,093,184	986,290	1,000,616	4d.
Uruguay	182,898	Not stated.	Not stated.	5½d.
Argentina	1,264,351	1,534,764	2,139,078	4½d.
Portugal	598,172	584,943	622,517	2s. 0½d.
Switzerland	679,200	681,478	747,500	1½d.
Norway	279,000	275,500	260,000	1s.
Germany	5,922,000	6,039,000	6,719,000	5½d.
Morocco	—	—	—	10% ad val.
Belgium	1,255,700	649,393	1,194,186	Free.
Sweden	401,079	444,125	476,659	3d.
France	1,837,000	1,947,000	2,405,000	9d.-11½d.
Austria and Hungary	2,032,700	2,051,703	2,347,700	9½d.
Bulgaria	160,656	82,716	79,449	4½d. and 14% ad val.
Spain	149,256	145,259	450,047	6½d.
Jamaica	48,559	47,958	45,470	1s.
Straits Settlements	5,870,266	6,708,933	6,549,984	Free.
Bermuda	89,600	90,720	88,480	5% ad val.
Mauritius	113,056	130,307	55,353	About 3d.
Honduras	32,799	27,409	32,954	2½d.
Barbados	53,116	55,850	44,820	3d.
Tobago and Trinidad	63,004	66,270	72,937	6d.

CITY BRANCH OF THE IMPERIAL INSTITUTE, AT 49, EASTCHEAP, LONDON, E.C.

The CITY BRANCH OF THE IMPERIAL INSTITUTE embraces:—

A SAMPLE ROOM for the display of raw and manufactured products from the Colonies and India, for which it is desired to find openings in markets at home and abroad.

An INFORMATION OFFICE where enquiries relating to industrial, commercial and other matters connected with the Colonies, India and Foreign Countries are received and promptly dealt with.

A NEWS ROOM supplied with:—

- (a) Hand-books and directories of the British Empire, including many pamphlets (for free distribution) dealing with Canada, the Australian States, New Zealand and South Africa.
- (b) The chief trade papers of Great Britain, the Colonies and India.
- (c) Many commercial periodicals of the United States, Germany, France, Austria, etc.
- (d) Market reports, prices-current, official reports and statistics.

The City Branch is in constant communication, by telephone and messengers, with the Imperial Institute, South Kensington. Curators and other members of the Imperial Institute staff will attend at the office at stated times and by special appointment, to deal with enquiries and to assist in establishing or facilitating business relations with mercantile houses, etc., in the Colonies and in India.

1. The Sample Room is open free to the public, by introduction.
2. The News Room is free to Fellows of the Institute, as is also the Enquiry Office for the supply of such information as does not involve special research or correspondence.
3. A subscription of the sum of one pound per annum, payable in advance, secures the free use of the News Room, and the supply, free of charge, of information not involving special research or correspondence.
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5. Non-Subscribers to the City Branch can be supplied with information upon the following terms:—
 - (a) First enquiry, not involving special research or correspondence, free.
 - (b) For each subsequent enquiry, not involving special research or correspondence, one shilling.
 - (c) For each enquiry, involving special correspondence, or reference to home-experts, etc., five shillings.
 - (d) For each enquiry involving Colonial or Foreign correspondence, ten shillings, or by special arrangement, if likely to be voluminous.
6. Subscribers will have to pay the charges specified under (c) and (d) in the foregoing clause, and Fellows will have to reimburse the Institute any out-of-pocket expenses incurred in connection with enquiries coming under those heads.
7. The Information Office will undertake to obtain analytical or other examinations of samples by competent Experts, upon payment, by persons submitting them, of the usual professional fees, to be previously specified, and agreed to by the applicant.
8. The Institute will undertake the supply, at cost price, of translations, into any language, of trade circulars, prices-current, etc., the conversion of weights, measures, coinages, etc.

Canadian Machine for Laying Bricks.—The United States Commercial Agent at Stanbridge, Quebec, reports the recent invention and trial of a machine for laying bricks. He describes the machine as one which is worked by two men and a lad, and says that it will lay from 400 to 600 bricks per hour. Door and window places cause only a slight delay for the purposes of adjustment. It is suited for all plain work, like walls, sheds, mills, factories, rows of cottages, piers of bridges, and, in fact, everything except the very finest class of work. Considerable pressure is put upon the bricks, and it is claimed for the machine that the work is done much more firmly than is possible by hand. It will, the commercial agent says, do the work of six or seven skilled bricklayers, and the opinion is expressed that such a machine, adapted to build a factory, say, 60 by 40 feet, could be put upon the market for the equivalent of £100. It is so simple that it can be worked easily after a fortnight's instruction.

Malleable Glass is the invention of Mr. Louis Kauffeld, of Matthews, Indiana, United States, who keeps the process a trade secret, but states that neither lime nor lead enters into its composition. The secret lies both in the ingredients and the fusing of them, so as to avoid prolonged heating of the crucible from without and corrosion of it inside. A lamp chimney of this glass taken out of ice-cold water, and immediately, without drying, placed on a flaming lamp, did not break, although the flame played upon it. Another chimney put over a gas stove, so as to become hot at one part, melted there without breaking, and a third was filled with cold water and held over a fire till the water boiled. A chimney may be dropped into boiling water, and then into cold water, without hurt. So tough is the glass that another test is to use it as a hammer to drive nails, and it can also serve as a mould to shape molten glass in. It can be made as thin as paper, or as thick as any glass in use. The daintiest table ware of this glass can be handled safely.—Scientific American.

MONTHLY COMMERCIAL AND INDUSTRIAL SUMMARIES.

GENERAL COMMERCE AND INDUSTRY. UNITED KINGDOM.

Latin-American Chamber of Commerce, Mines, and Industries of London.—It is proposed to establish in London a Chamber of Commerce, Mines, and Industries, with the objects of (1) protecting and promoting British commercial and financial interests in the Republics of South and Central America and Mexico, (2) of making the markets and resources of those countries better known in England. The preliminary circular calls attention to the immensity of our interests, mentioning that it is estimated that more than £600,000,000 of European capital, principally British, has already been invested in those countries in State loans, railways, and other enterprises, whilst the amounts involved in commercial and private businesses are enormous. They consume imports to the value of about £80,000,000 per annum, and export produce to about the value of £105,000,000. All of them abound in vast natural resources capable of almost unlimited development. Their progress has hitherto been retarded by causes which are well known, but, as these pass away, the increase of their commerce will be great and rapid. The importance of not only holding our own, but of extending our relations as the countries advance, cannot be disregarded. It is indisputable that Great Britain has hitherto held a position of commercial and financial supremacy in those markets, but it is well known that our competitors, notably the Germans and North Americans, have been making systematic and strenuous efforts to extend their business with them to our disadvantage. That their endeavours have been attended with a large measure of success can be seen from numerous reports of the Consuls of our own and other countries. The British representatives have been constantly warning us that, unless some organised measures be taken for the protection of our interests, our position will be seriously imperilled. Sir Alfred Bateman, of the Board of Trade, says, in a Blue Book recently issued by that Department, "We have lost ground proportionately in Argentina, Uruguay and Chili."

It is intended to organise this Chamber upon thoroughly practical lines such as experience has shown to be necessary. Besides the ordinary functions of a Chamber of Commerce, it will be, first of all, a special information office, where all the official publications of the various republics and also the Consular reports from all countries and all documents bearing upon the trade may be consulted. Permanent exhibitions of products and goods consumed could be established. The Chamber should have special correspondents in every business centre of the Republics and States, who should supply it with reports upon all matters referring to trade, industries, mines, finance, opportunities for new business, contracts open, etc. It would publish a special bulletin to be sent to the members, as it is not always found convenient to call at a Central Office.

Oil as Fuel.—The Navy Department has made public the report of Lieut. Ward Winchell, U.S.N., the expert detailed by the department to investigate and report upon the efficiency and installation of the oil-fuel system as fitted to the Oceanic Steamship Company's steamer *Mariposa*. The gross displacement of the *Mariposa* is 3,160 tons. The average horse-power developed was about 2,481. The average distance made each day by the ship was 354 knots, giving a mean speed of 13.53 knots an hour. There were consumed each day about 278 barrels of oil, which gave an average consumption of 3,720 pounds per hour. It practically required 1½ pounds of oil per hour to secure an horse-power, and while this result has been secured on shore in highly efficient engines, the consumption is practically 50 per cent. less in weight of the combustible than would be required of coal. The ship required 262 hours to make the voyage from San Francisco to Tahiti, while only 260 hours was required to make the return trip. By the use of oil as a fuel the complement of the ship was reduced from 81 to 55, thus decreasing the force in the engine room from 36 to 20 men. The crude oil was atomized by means of an air compressor, which had a capacity of a thousand cubic feet of air per minute compressed to thirty pounds. The *Mariposa* has eighteen furnaces in her boilers, only twelve of which were used. Two burners were installed in each furnace, although all the burners were not in use, except at short intervals, when the engines were run at full power. Careful inspection did not show any effect of the flame on any part of the boilers. Upon reaching Tahiti, after the run, the tubes were swept by scrapers, and all the refuse collected barely filled two ash buckets, and some of this came from the coal which had been used on one of the preliminary trials.

COLONIES.

Australian Pearling Industry.—An interesting report on this industry has been compiled by Mr. Justice Dashwood, the Government Resident of the Northern Territory. Coloured labour has practically captured this industry, so that it presents a difficulty in the carrying out of the declared policy of the Commonwealth Government to secure a "white Australia." Mr. Dashwood states that, beyond a few owners and employers, there are now no white men actually engaged in pearling within the limits of his official observation. The value of the pearl-shell raised in the Torres Straits fisheries had fallen from £126,042 in 1897 to £105,403 in 1901, although a greater number of men and boats had been employed. Divers are paid from £20 to £25 per ton for the shell, with an additional wage varying up to £12. 10s. per month. In Customs Duties the Commonwealth received directly from the industry nearly £4,000 per annum. The great majority of the witnesses examined by Mr. Justice Dashwood declared that the industry could not be carried on by white crews, because the work was hard, the life monotonous and rough, and the climate trying. As to white divers, opinion differed. Under better conditions white men might be obtained, but after a careful consideration of the figures Mr. Dashwood is satisfied that the consequent increase in working expenses would prevent the industry being profitably carried on. As to the present profit on the capital invested, some witnesses put it as low as six per cent., others as high as from 25 to 50 per cent. At Port Darwin, Mr. Dashwood's headquarters, there was a practically unanimous consensus of opinion that the compulsory introduction of white men would mean the extinction of the industry. Japanese, Malays, Chinese, Javanese, and various other nationalities constitute the motive power of the industry. The prosperity of Thursday Island was at present entirely dependent on these fisheries. Mr. Dashwood incidentally reports a considerable revival in bêche-de-mer fishing, the value of the trade, after a series of dull years, having risen from £1,255 in 1900 to £7,399 last year.

Canada.—**NICKEL OUTPUT.**—In his report for 1901 Thomas W. Gibson, Director of Mines for Canada, says:—"The leading place in the list of mineral industries is accorded to nickel mining, which produced returns exceeding in value those of any other branch of the industry. The output in 1901

was the largest ever recorded, and owing to the more extended manipulations to which the nickel-copper matte of the Sudbury district is now subjected previous to its exportation, the product has a much larger value than ever before. The production for the year amounted to 4,441 tons, valued in the matte at \$1,859,870, an increase in quantity of 25 per cent., and in value of 145 per cent. as compared with 1900, when the yield was 3,540 tons, valued at \$756,626. Owing to the process of re-treatment of the low grade matte now adopted at the Ontario Smelting Works at Copper Cliff, the average price at which the nickel contents of matte were appraised in 1901 was 20.9 cents per pound, as compared with 10.7 cents per pound in 1900. This is a very appreciable advance in the direction of having as much as possible of the labour requisite to transform the raw material into the finished article of manufacture performed in this country." Since 1897 the quantity of ore smelted has increased from 96,093 to 270,380 tons; the value of the nickel produced from \$359,651 to \$1,859,970; the value of the copper output from \$200,067 to \$589,080. Returns covering the first three months of the current year show that the advance is being maintained, as the nickel yield shows a gain of \$355,498, and copper a gain of \$121,545 over the first quarter of 1901.

Pig Iron in Canada.—The American Iron and Steel Association reports that in the first six months of 1902 the production of all kinds of pig iron in the whole of the Dominion of Canada amounted to 157,804 gross tons, as compared with 149,952 tons in the last half of 1901, and 95,024 tons in the first half of the year. The increase in the first half of 1902 over the last of 1901 was 7,852 tons, or over 5 per cent., while the increase over the first half of 1901 was 62,780 tons, or over 66 per cent. Of the total production in the first half of 1902, 12,000 tons were Bessemer and low phosphorous, and 57,209 tons were basic pig iron. The coke furnaces made 147,892 tons, and the charcoal furnaces 9,912 tons. Neither spiegeleisen nor ferromanganese has been made in Canada for several years. The unsold iron held by Canadian pig iron manufacturers on June 30th, 1902, none of which was intended for their own consumption, amounted to 37,721 gross tons, as compared with 59,472 tons on December 31st, 1901, and 28,711 tons on June 30th, 1901. Of the unsold iron on hand on June 30th, 1902, less than 2,000 tons were made with charcoal, the remainder being coke iron. On June 30th, 1902, Canada had fourteen completed blast furnaces, of which eight were in blast and six were idle. Of this total nine were equipped to use coke for fuel, four to use charcoal and one to use mixed charcoal and coke.

Ceylon.—**INDUSTRIAL DEVELOPMENT.**—A question which will have shortly to be dealt with, says a writer in *The Times*, is the development of extensive regions to be opened by the new Northern Railway from Kurnegalle to Jafna, and lying beyond the influence of the restored tanks, and of land capable of being utilized for rice cultivation. An experienced English farmer, who has twice visited this country, has been giving his opinion of late that it can well be adapted to stock-raising—that cattle seem to be in better condition around Anuradhapura, even at the end of the dry season, than they are in the comparatively wet western province. In fact most of the country is the same in soil and climate—whenever cleared of scrub and jungle undergrowth—as parts of Southern India, whence Ceylon now imports every year live stock to a value in our local market (not the nominal value at the Customs, there being no import duty) of £130,000. The following figures for three periods are from Ferguson's *Ceylon Directory*, and show the imports into Ceylon of live stock:—

	1895.	1900.	1901.
Horses, No.	627	534	453
" Nominal value . . .	R. 179,290	169,190	154,850
Cattle, No.	18,381	26,530	29,093
" Nominal value . . .	R. 410,550	613,230	650,940
Sheep and Goats, No. .	68,940	96,330	111,733
" Nominal value . . .	R. 332,570	544,520	683,260

Horses are included because an experiment under the auspices of Mr. R. W. Ievers, C.M.G., an experienced Civil servant, assisted by the Government veterinary surgeon, Mr. Sturgess, shows that good-sized and useful ponies or small horses can be successfully bred a little further north on the island of Delft. If the Ceylon Government were prepared to lease blocks of from 5,000 to 10,000 acres for stock-raising purposes, it is possible that squatting capitalists from Australia and elsewhere might be attracted.

Jamaica.—**EXPORT TRADE.**—It will be seen from the following approximate statement, published by the *Mercantile Intelligencer*, what vast strides have been made in certain Jamaican exports this season:—

APPROXIMATE STATEMENT SUPPLIED BY THE MERCHANTS' EXCHANGE.

Articles.	From 1st April, 1902, to 20th September, 1902.	From 1st April, 1901, to 31st August, 1901.
Coffee cwt.	32,126	10,717
Cocanuts No.	11,721,176	5,879,845
Cocoa cwt.	7,537	9,434
Dyewoods tons	19,680	16,968
Bananas behs.	8,239,239	5,285,636
Oranges No.	12,297,303	3,643,990
Ginger cwt.	18,253	14,339
Pimento "	47,001	21,927
Rum galls.	1,395,423	1,150,350
Sugar tons	11,270	10,593

COTTON CULTIVATION.—Amongst the increasing number of places where the movement for the extension of cotton cultivation within the British Empire is receiving attention, it is interesting to find the WEST INDIES included. At the end of the eighteenth century the West Indies were the chief source of England's cotton supply. Tobago, at that time, grew cotton of the finest quality. Ten years ago cotton of the Sea Island variety was planted in Turks island, and the result was a shorter cotton, but of excellent quality. Egyptian cotton has been tried in Jamaica, but the colour was not satisfactory. It is stated that the old variety of cotton, which is still found growing in some places in Jamaica, produces a quality of marketable value, but to gain a footing in the markets it would be necessary, should the industry be attempted, to produce a cotton of distinctly superior quality. There seems no reason why Jamaica should not grow good cotton, and it has been suggested that the Jamaica Government should take the matter up and induce some enterprising planter to grow an experimental crop.

Malay States.—**COFFEE EXPORT.**—The fifth annual report of the United Planters' Association, Federated Malay States, contains an interesting statement regarding some attempts which were made to develop the export of coffee to Europe. With the idea of eventually placing regular monthly consignments of 100 piculs upon the London market to attract attention to the coffee, several members combined and sent a trial shipment of 80 piculs. This was bulked in the Port

Dickson Company's mills, and sold through Messrs. Frame Alston and Arbuthnot. The price realised was 32s. per cwt. which worked out to \$17.78 per picul. The result was not sufficiently encouraging to provide any inducement for persevering with the experiment, and no further shipment of any size was made. There may be markets where old coffee is eagerly competed for, but Singapore is certainly not in touch with any of them. Reports from London brokers favour shipments of coffee dried in the cherry before peeling, and report such coffee to be sweet and suitable for home consumption, but it is suggested that a market for this description must be gradually built up, and no shipments of any size are known to have been made. The export returns for Perak, Selangor, and Negri Sembilan show an increase in 1901 of 6,476 piculs; this must be considered a satisfactory result in view of the fact that prices averaged \$18.29 per picul, as against \$20.80 in 1900. A good deal of coffee has, nevertheless, been planted in 1901, mostly in conjunction with Para rubber, and cultivation has been well maintained, whilst quality has improved, and complaints on this score have been much less frequent.

South African Trade.—At a meeting of the South Africa Trade Committee, held at Palace-chambers, Westminster, the reports of two of the Commissioners sent to South Africa to enquire into and report upon the openings for trade there were submitted. Mr. J. Lockie presided. Mr. B. H. Morgan, the Engineering Trades Commissioner, dealt at length with the conditions of trade in South Africa. He forecasted the trend of the reports in stating that there were enormous opportunities for trade in engineering lines, and particularly in machinery utilized in dock and harbour construction, railway extension, mining, and agricultural work. The harbour work includes contemplated improvements and work in progress at Saldanha Bay, Cape Town, Simon's Town, Port Elizabeth, East London, and Durban, for which an enormous amount of machinery has still to be purchased. New railway lines and extensions are in contemplation and being proceeded with in Cape Colony, Orange River Colony, Transvaal, and Natal, and he explained and laid before the meeting special drawings showing such improvements and extensions, and the class of machinery that would be required in such case. In regard to the mining industry of the Rand, he was of the opinion that as soon as the political atmosphere cleared, enormous development would take place, and a large quantity of mining and electrical machinery of all kinds would be required. Agriculture is already making headway in every direction, and the demand for machinery and implements was very large, and would increase as the country settled down. Similarly bright prospects were held out to manufacturers of steam engines and general tramway and lighting equipment for towns, and he dealt in detail with the prospects of trade in iron and steel constructional work. He found that German and American competition was everywhere very keen, and although prospects of trade were so good, business could only be obtained by enterprise and "pushfulness," and a thorough appreciation of the requirements of the market. He was surprised at the antiquated methods of business which British manufacturers adopted in dealing with this market, and he hoped that the exposure of such methods in his report would open the eyes of British manufacturers and traders, and help to bring about a better condition of things.

INDIA.

Trans-Frontier Trade of Burma.—According to the official report the total value of the trans-frontier trade of the province last year was 357 lakhs, or nearly 2½ millions sterling. A quarter of this total was absorbed by Western China, a quarter by the Northern Shan States, and a quarter by the Southern Shan States. Comparing the two triennial periods, there was an increase of nearly 20 per cent. in the latter of the two, the exports from Burma to the adjacent countries having grown more rapidly than the imports. Of the exports, about a fourth consists of silver, more than a fourth of British and Indian cotton yarns and piece-goods, and a fourth of salt fish, silk goods, raw cotton, and railway materials—the latter being doubtless for the construction of the Mandalay-Kunlon line. Timber and treasure absorb half the import trade, and cattle and tea a quarter. The growth of the trade with Western China during the last three years is the most conspicuous feature of the statistics. Imports more than doubled and exports increased by more than half. Compared with the previous triennial period, imports from Western China of raw silk increased by over seven lakhs. In exports the chief increases were:—In cotton yarn and twist 12½, silver 7½, European cotton piece-goods nearly 8, dry fish over 3½, and woollen piece-goods about 3½ lakhs of rupees. The report adds that these figures show that the trade with Western China is capable of development, and various improvements in transport conditions, etc., all tend to an increase of this trade with China.

FOREIGN COUNTRIES.

Natural Gas in America.—It is universally recognised that much of the great growth in manufactures in the United States during the past 20 years has been due to the use of natural gas. A recent report by the United States Geological Survey furnishes figures showing the extent to which it is in use. The value of natural gas consumed in the United States in the year 1901 was \$27,067,500. The general rate at which this is sold is 15c. per 1,000 cubic feet. It is, therefore, estimated that the consumption during the year in question was equivalent to 180,450,000,000 cubic feet. If the 20,000 cubic feet of natural gas which is taken as the equivalent of a ton is assumed to be correct, this amount of gas displaces or adds to the production of heat units as much as would come from 8,458,600 tons of coal. The value of this product for 1901 exceeded that of 1900 by \$3,368,826, and that of 1899 by \$6,992,627. It is estimated that, considering the displacement of coal and wood effected by natural gas, this product, as a whole, represents nearly half of the entire value of the various petroleum products of the country. Not only has the consumption increased, but the number of wells was also slightly greater at the end of 1901 than in the preceding year. During the year 800 miles of pipe were laid down, bringing the total length of main for use in the transport of this product up to 21,848 miles. It would naturally be expected that a consolidation of companies would go on with this industry, as in others, but, in spite of this, there were a large number of new companies, which necessitated the addition of many millions of new capital. As showing its employment in industry, the report says that natural gas is in use in 5,742 establishments, 102 of which work in iron and steel and 219 in glass. In addition, it is estimated that fully one million domestic fires are supplied by natural gas, and that four million people are furnished in this way with both fuel and light.

Wireless Telegraphy.—It has now been proved that it is practically possible to cross the Atlantic, and to remain in communication with the land all the way across *via* various ships, which can act as retransmitting stations. If all the vessels plying between America and Europe were similarly fitted with wireless telegraphic apparatus, it would be possible for a business man to remain *au courant* with home or the commercial world during the whole passage.

LABOUR MARKET. UNITED KINGDOM.

Hours of Labour of Railway Servants.—In the report recently issued by the Board of Trade the complaints made against various companies are set out, together with the action taken by the Board. In all the cases the complaint is of long hours put in by guards, engine-drivers, signalmen, shunters, and other *employees* of the companies; and the report refers to the fact that the year under review was remarkable for the large number of complaints under this head. There can be no doubt, the report states, that in many instances long hours have been due to exceptional circumstances, particularly to the bad weather and fogs which were prevalent during last winter over many parts of the United Kingdom; but, even allowing for such considerations, it cannot be denied that in many of the cases which have come to the notice of the Board of Trade the complaints have been well founded. The Board have continued, as in former years, to make careful enquiry into each representation which has been made to them; and their consideration of the cases which have been dealt with has led to the belief that, while there is not, as a rule, much exception to be taken to the booked hours of duty of railway servants, sufficient care has not always been taken to confine discrepancies between the booked hours and the hours actually worked within the narrowest possible limits. That this is one of the chief grounds for complaint may be to some extent inferred from the fact that 96 out of the 123 cases which have arisen during the year have concerned trainmen, whose duty is, owing to the exigencies of railway working, subject to greater variation than that of perhaps any other class of servant. The report states that in accordance with the resolution of the House of Commons, the Board of Trade have called upon the railway companies for a return of the hours exceeding 12 a day, of certain classes of railway servants during the month of December, 1901, and of instances where after such a period of duty work has been resumed with an interval of rest of less than nine hours. The return will soon be ready for issue.

File-cutting Industry.—The Home Office has issued a draft of regulations proposed to be made for file-cutters' shops. The regulations are not, it is stated, in their final form, and they are subject to revision. File-cutting by hand is certified, for reasons given, to be a dangerous process, and it is so certified by the Home Secretary in pursuance of section 79 of the Factory and Workshop Act, 1901. The reasons for this step are, briefly (1) that it has been shown conclusively that file-cutting by hand under the circumstances which actually prevail, is extremely injurious to the health of the workers, and produces the highest mortality of all processes carried on in factories and workshops; (2) that, as the result of the enquiry in 1897-98 of the Committee on Dangerous Trades, there was a general agreement in favour of regulations; and (3) that recently the necessity of establishing regulations under the Act had been strongly urged by a deputation from the health committee of the Sheffield City Council. While Mr. Akers-Douglas believes that the regulations are likely to effect a considerable improvement in the conditions under which the industry is carried on, and to be effective in preserving the lives and health of the workpeople, they will not, he thinks, impose any heavy burden on the owners of the file-cutting shops, nor require of the workpeople anything more than they can carry out without interfering with their work.

COLONIES.

The monthly report, compiled by the EMIGRANTS' INFORMATION OFFICE, states as follows:—**Canada.**—The last monthly report of the Canadian Department of Labour shows that skilled mechanics had been very busily employed in the building and other trades, that lumbermen had been very busy, and good hands were scarce, and that, owing to the good harvests, both in the east and the north-west, farm labourers and harvesters had been in great demand. It is too late in the season, however, for anyone other than female servants to emigrate this year to Canada, unless he goes to friends, or has enough means of his own to keep him while work is slack in winter. A good many coal-miners in British Columbia are out of work, but in Nova Scotia there is a demand for skilled men.

Australia (New South Wales).—No one is recommended to emigrate to New South Wales at the present time, unless he is a skilled plumber, or has means of his own, or has secured employment. Large numbers of miners (except coal-miners), pastoralists, and others are out of work, owing to the severity of the drought, which has now lasted over six years, and it will be scarcely possible to provide work for all these on either the reproductive or relief works initiated by the Government. The only opening at the present time is for female labour, either in domestic service, or in boot and shoe and clothing factories. The annual report on the Metropolitan and Newcastle factories for 1901 shows that the number of registered factories increased from 2,047 in 1900, to 2,195 in 1901, and the number of employees from 39,104 to 42,273. The principal increases were in the meat-preserving, jam and fruit canning, bacon-curing, shirt-making and glass bottle-making factories. The building trades and engineering shops were well employed during the year; more than half the furniture makers were Chinese; the wages of tailors improved. A dispute has arisen between the shipwrights and joiners in the ship-building trade, which may lead to trouble. The shearers have abated their demand, and now claim that their wages should be increased from 20s. per 100 to 22s. 6d., instead of to 25s., as previously asked; the dispute is still unsettled. (**Victoria.**)—With the exception of Gippsland and the West, which are a little better off, the State is suffering severely from the drought, and emigrants without means are advised not to go there at present. The payment of railway employees, receiving £150 a year and over, has been reduced. Special Boards, appointed under the Factories Acts, have fixed the lowest wages payable to persons manufacturing wicker goods at 1s. an hour; to compositors and stereotypers, at 1s. 0½d. to 1s. 1d. an hour; to persons engaged on linotype or monoline work, at 1s. 6d. to 1s. 8d. an hour; and to lithographers and bookbinders, at 1s. 1d. an hour; to males above 16 years old making boots and shoes at 6s. 8d. to 7s. 6d. per day of 8 hours, and to females with four years' experience at 20s. per week of 48 hours; to male blacksmiths in the bedstead trade, at 42s. per week of 48 hours, and to female polishers of japanned work, at 22s. 6d. per week of 45 hours; to wool scourers in the woollen trade, at 30s. a week; and to female warpers (first year), 15s. a week; and to persons making bottle or flue brushes, at 48s. a week. (**South Australia.**)—The drought has been severe, and there is no demand whatever for more labour; but good rains have just fallen in the agricultural districts, which should improve matters. (**Queensland.**)—The long drought is causing great losses in Queensland, and there is no demand for more labour, except for a few farm labourers in the south, and for female servants in most parts. (**Western Australia.**)—There is a good demand for farm labourers and female servants, but the supply of mechanics and miners is sufficient. The dispute between the miners and mine-owners at Kalgoorlie has been settled by the Arbitration Court—rock drill-men are to receive 13s. 4d. to 14s. 4d. per shift (8 hours), and miners 11s. 8d. (**New Zealand.**)—During the last few weeks work has been rather

slack, as is usual during the winter season. For those emigrating now the prospects are good. In Taranaki the dairying industry is very prosperous, and dairy factories are increasing. Competent men have no difficulty in getting work on the land; the building and other trades have also been doing well, and building plots are sought for, and sell at advanced prices.

South Africa.—Permits to land are not now required in Cape Colony or Natal, but are still required by those proceeding to the Transvaal and Orange River Colony. There is no demand whatever anywhere for general labourers. Owing to the large numbers who have recently arrived, there is no special demand for mechanics anywhere; but really skilled mechanics—especially those in the building trades—have a very fair chance of work, if they can afford to keep themselves some little time while searching for it. They must remember that the cost of living is high in all parts, and in the Transvaal from two to three times as high as it is in England. A few experienced platelayers and carriage and wagon examiners are wanted for the Natal Railways; application should be made to the Agent-General for Natal, 26, Victoria-street, London, S.W.

There is a good demand for female domestic servants, but they should not go alone, unless they go to friends, as they will find suitable lodgings very expensive and difficult to obtain, and will incur other risks. Advanced passages to the Transvaal may be obtained by female servants in special cases on application to the South African Expansion Committee, Imperial Institute, London, S.W. Single men who can ride are wanted for the South African Constabulary. They should apply at the Recruiting Office in King's-court, Broadway, Westminster, S.W.

EMIGRATION AND IMMIGRATION.

**** The Imperial Institute acts in concert with the Emigrants' Information Office (which is under the direction of the Colonial Office), of 31, Broadway, Westminster, S.W.; and also with the British Women's Emigration Association, now temporarily carrying on its work in rooms at the Institute. The Handbooks and Quarterly Circulars issued by the Emigrants' Information Office may be obtained at the Commercial Intelligence Office. Special information and practical advice respecting Canada and Cape Colony will also be furnished by the Curators of these Sections.**

UNITED KINGDOM.

The British Women's Emigration Association.—The hon. secretary reports 553 applications relating to emigration to South Africa, and 157 to other colonies, received in one month ended October 21.

During the same four weeks 53 persons have sailed through this Association—14 to South Africa, 38 to Canada, and 1 to Australia. The last party of the season to Canada on October 30 numbered 31—a considerable number—making a total of 227 to Canada since March; most of these travellers have been glad to avail themselves of the accommodation at the Wortley Hostel, 22, Upper Westbourne-terrace, for a night or two before sailing. When furnished completely the house will contain about 36 beds. A very handsome contribution of over £180 has been received for the benefit of the Hostel, as the result of a drawing-room meeting, arranged by Mr. and Mrs. Stanley Boulter, at which Lady Brassey kindly presided, on October 7, at Garston Park, Godstone.

A formal opening of the Hostel will take place early in December.

The South African Expansion Committee has taken an office at 47, Victoria-street, Westminster, to provide the larger accommodation required for the increase of its Secretarial Staff. All enquiries about emigration to South Africa should in future be addressed there.

Indulgence passages are no longer to be had, but the Women's Immigration Department of the Transvaal administration has made special arrangements for the assistance of the domestic servants applied for from that colony, and the selection of the women is placed in the hands of the South African Expansion Committee of the British Women's Emigration Association; only the classes of persons for whom a requisition is sent can be allowed the advantages offered. These are principally that the whole cost of the journey is advanced, which £12 is to be repaid in our colony to the Transvaal Committee. Each person must sign an agreement undertaking to refund this sum in monthly instalments.

The first party going out on these terms is by s.s. *Harlech Castle* on October 23. Their reception at Cape Town and inland journey will be arranged by the Agent of the Women's Immigration Department in the Transvaal. A Matron will be placed in authority over them from London to Johannesburg, and free accommodation will be provided on arrival, where the women can stay until suitable situations are found for them.

A party for Australia will be made up to travel in the deck cabin of s.s. *Austral* sailing November 21. Early application should be made for berths in this ship. All information and estimates can be supplied by the hon. secretary, British Women's Emigration Association, the Imperial Institute, London, S.W.

COLONIES.

Canada.—IMMIGRATION FROM THE UNITED STATES.—According to a Winnipeg special to the *Evening Post*, the extent of the immigration into Manitoba and the North-West Territories from the United States, is little understood in the east. Sir Charles Dilke's prophecy of twelve years ago that these fertile lands would become the wealth centre of the Dominion is already being fulfilled. For the year ending June 30, 1902, 19,570 persons from the United States took up homesteads in Manitoba and the North-West Territories, against 5,197 in the preceding year. Actual settlers number five times as many, as only heads of families can take up homesteads. In 1900, land along the C.P.R. was worth \$3 an acre; now there are few obtainable lots close to the lines, while the price of the nearest is \$7 to \$8 an acre. An examination of Winnipeg hotel registers shows that 40 per cent. of the visitors are from the United States. It is said that the cheapness of land makes it possible to produce wheat and flour at less cost than in Minnesota or the Dakotas. Millers of Minneapolis and St. Paul are anxious to get Canadian wheat, and are advocating reciprocity with Canada with the idea of having the grain duty removed. This influx of Americans is proving a great benefit to Canadian development, especially in the line of capital, as the American settlers are bringing millions with them into the country.

Suez Canal.—The Norddeutscher Lloyd steamer *Grosser Kurfürst*, 13,180 tons, sailing from Southampton on November 10, will be the largest mercantile steamer passing through the Suez Canal, and that a steamer of this tonnage can make the passage without difficulty, is proof of the improvements which have of late been made in the canal both by dredging and widening. The biggest warships to pass through the canal were the great Japanese battleships *Asama*, *Shikashima*, and *Nikasa*, built in this country by Armstrong, Whitworth and Company and the Thames Ironworks.

CUSTOMS TARIFFS. UNITED KINGDOM.

Certain Fuses may be Imported without Licence.—A recent General Order of the Commissioners of H.M. Customs (No. 61 of 1902) states that Vulcan patent electric delay action fuses may be imported without licence.

Drawback on Exports of Maize Starch of British Manufacture.—The following is the text of a General Order (No. 76 of 1902), recently issued by the Commissioners of H.M. Customs for the guidance of Customs officers, respecting the drawback to be allowed on exports of maize starch of British manufacture:—

"Collectors and other officers concerned are informed for guidance that the Board have directed that drawback be allowed on exported maize starch of British manufacture at the rate of 2½d. per cwt.

"All duly substantiated claims in respect of British-manufactured maize starch exported since the 7th May last inclusive will be settled in the usual manner by the Collector, London, at that rate accordingly."

COLONIES.

Australia.—DUTIES ON GOODS IMPORTED INTO WESTERN AUSTRALIA FROM AUSTRALIAN STATES.—An Act (No. 3 of 1901) which was assented to on 9th October, 1901, imposes certain Customs duties in accordance with the provisions of the Commonwealth of Australia Constitution Act (cap. 12 of 1900, Imperial Statutes).

The Act mentioned re-imposes the duties of Customs in force in Western Australia at the date immediately preceding the imposition of uniform duties of Customs under the Commonwealth of Australia Constitution Act, so far as they relate to goods passing into Western Australia, and *not originally imported from beyond the limits of the Commonwealth*, and it is provided that the duties shall continue in force subject to the provisions of section 95 of the said Act.

Section 95 of the Commonwealth of Australia Constitution Act provides that:

"Any duty imposed on any goods shall not exceed during the first year the duty chargeable on the goods under the law of Western Australia in force at the imposition of uniform duties, and shall not exceed during the second, third, fourth, and fifth of such years respectively four-fifths, three-fifths, two-fifths, and one-fifth of such latter duty, and all duties imposed under this section shall cease at the expiration of the fifth year after the imposition of uniform duties."

"If at any time during the five years the duty on any goods under this section is higher than the duty imposed by the Commonwealth on the importation of the like goods, then such higher duty shall be collected on the goods when imported into Western Australia from beyond the limits of the Commonwealth."

It may be added that uniform Customs duties were imposed in the Commonwealth of Australia on 8th October, 1901.

Newfoundland.—CUSTOMS AMENDMENT.—The Board of Trade have received, through the Colonial Office, a copy of an Act (No. 27 of 1902) to provide for the reduction of duties on certain Portuguese products.

The above Act was passed on 22nd April, 1902, and provides that:—

"When and as soon as such changes have been made in the Tariff of the Kingdom of Portugal as will admit into that country fish, the product of Newfoundland, at the same rate of duty as fish, the product of the Kingdom of Norway, is admitted therein, the Governor shall, by Proclamation published in the *Royal Gazette*, reduce the duty on port wine, the product of Portugal, from 1 dol. 80 cents to 90 cents per gallon; and upon the issue of the said Proclamation, the duty upon port wine, the product of Portugal, imported into this colony, shall be 90 cents per gallon."

Transvaal.—PERMITS FOR THE IMPORTATION OF GOODS: REVISED REGULATIONS.—The *Government Gazette* for the 12th of September last contains revised Regulations issued by the Director of Supplies, Johannesburg, in regard to permits for the importation of goods.

On the 1st September last, the following system for the presentation of indents came into force.

Goods may, in future, be classified under the following headings:—

Foodstuffs (including fresh vegetables and fruit, flour, mealies, mealie meal, mineral waters, and all articles for household consumption).

Produce (including forage, grain, and all foods for animals).

Soft goods (including boots and shoes).

Mining requisites and machinery (including vehicles for mining purposes only, and excluding timber).

Building materials (including bricks, cement, iron (manufactured) for building purposes, and all analogous bulky material for construction. Deals and logs are excluded).

Timber.—Logs, deals and poles.

Iron and Steel unmanufactured.

Hardware (including machinery (not for mining purposes), agricultural implements, ironmongery, paints, glass, china, and articles known commercially by the term "hardware" and not otherwise specified).

Furniture (including pianos and organs).

Sundries.—Including drugs, fancy and sporting goods (except arms and ammunition), bicycles, stationery, jewellery, tobacco, cigars, cigarettes, and all other articles not otherwise specified.

Oils and lubricants.—Including oils (illuminating and lubricating), grease, etc.

Exceptions.—The exceptions to the above are:—

Wines, spirits, beer, and all intoxicating liquors, live-stock, vehicles, arms and ammunition.

All of these will be dealt with specially. No application for the importation of arms and ammunition which have not complied with Government Ordinance will be considered.

Presentation of indents.

Indents may accordingly be presented showing no other detail than simply the weight desired to be imported, under one or other of the above headings. Although applicants may wish to import under more than one heading, all may appear on the one indent (made as usual in duplicate).

Indents for importations which come under the heading of "Exceptions" must be shown separately, each being provided for by a distinctive indent.

Copies of Customs Declarations.

Copies of Customs declarations and invoices need no longer be furnished to any Civil Supply Permit Office.

CONSIGNMENTS BY PASSENGER TRAIN, ETC.: REVISED REGULATIONS.—Revised regulations, issued by the Director of Civil Supplies, Johannesburg, have also been received in regard to consignments by passenger train and conveyance of small parcels, perishable articles, and travellers' samples, etc.

On and after 15th September, 1902, the following regulations obtain:—

1. **Consignments and effects by passenger train.**—No permits from this department will be required for consign-

ments of any description by passenger train (except liquors).

(This does not include goods in trucks attached to passenger trains.)

2. *Small parcels, etc.*—Permits for small parcels and consignments of goods up to, but not exceeding, 100 lb. in weight, may be obtained from Civil Permit Controllers at Cape Town, Port Elizabeth, East London, Durban and Lourenço Marques.

These permits will be issued at the discretion of the Controller, and are only intended to afford convenience in fulfilling urgent requirements of consignees.

3. *Perishables.*—No permits will be required for consignments of "perishables" forwarded by recognised "perishable train."

This does not include refrigerator or insulated trucks.

4. *Travellers' samples.*—Permits for travellers' samples up to, but not exceeding, 2,000 lb. gross weight, can be obtained on application to the "Transvaal or Orange River Colony Enquiry Office," Cape Town, also to Civil Permit Offices at Cape Town, Port Elizabeth, East London, Durban and Lourenço Marques.

TARIFF AMENDMENTS.—According to a *Times* telegram, an Ordinance was issued on the 8th ult. amending the Customs Tariff. The amendments, which are provisional pending negotiations with the other colonies for a Customs Union, include the abolition of duties on machinery, building materials, metals, and agricultural implements, and reductions of duties on many articles. The duties on wines and spirits have been increased—that on perfumed spirits to £1 per gallon, on liqueurs to 15s., and on other spirits to 14s. No change is made in the existing duty on dynamite, which was imposed with the intention of practically prohibiting importation, owing to the fact that some questions bearing on the conditions of manufacture and importation into the Transvaal are still under discussion, but this duty will be separately dealt with as soon as possible. The amended Tariff Ordinance abolishes the free importation of spirits from Mozambique and Orange River Colony.

The special duties of 3d. each on poles and of 1d. per lb. on sulphuric acid, of 3d. on lead, and of 6d. on copper wire have been cancelled. All iron is admitted free, and the cost of building is greatly reduced by the removal of the duty of 11s. 3d. per cask on cement and of 7½ per cent. on timber. The alteration of the duty on cigars and cigarettes, from 15s. per 100 in the former case, without distinction as to size, to 6s. per lb., and in the latter case from 15s. per 1,000 to 4s. per lb., is considered equitable.

The special duty on jams of 40s. per 100 lb., which meant 5d. per tin, and the same duty on confectionery have been reduced to 12s. 6d., showing a reduction of 27s. 6d. per 100 lb. The special duties of 10s. on oats and 5s. on oat hay have been repealed. The anomalous duties, and most of those a change in which has been agitated for years, have been amended. More especially the duty on matches, which were specially taxed at 4s. per gross for the benefit of a concession, has now been reduced to 2s. per gross. No mention is made of the special duties which were suspended in 1897 owing to the agitation in Johannesburg, but which the Government reserved the right to reimpose at one or three months' notice. They remain suspended, and it is expected that they will be wiped out.

The free list is extended to public and military stores and to the goods above mentioned. Apart from the abolition of special duties on fodder, bottles, and various other articles, the special duties on foodstuffs have been reduced. Further, the Ordinance gives notice that it will provide for the management of the Customs at the ports of entry, and that the regulations for importing and exporting goods and for regulating the rebates on importations will remain subject to permits required by the Director of Supplies.

The revised tariff was to take effect on the 22nd ult.

FOREIGN COUNTRIES.

Argentine Republic.—IMPORTATION OF PLANTS AND SEEDS.—An Argentine Law, dated the 10th July, 1902, allows the importation of plants and seeds into the Republic, subject to previous inspection, and to disinfection or destruction as the case may require. The regulations, dated the 23rd August, amplify the above Law, and state that Buenos Ayres is the only port at which such importations may be effected. Persons desiring to import plants or seeds, are required to address a petition to the Agronomical Section, setting forth the name and address of the importer, the name and place of origin of the plants or seeds, the means of introduction and date of arrival, and the purpose and (if possible) the place for which the goods are intended.

The translations of the Law and Regulations, may be seen on application at the Commercial Intelligence Branch of the Board of Trade.

Cuba.—ALTERATION IN DUTIES ON LIVE-STOCK, ETC.—The Board of Trade have received, through the Foreign Office, a translation of a recent Cuban Law altering the rates of Customs duty leviable on live-stock and on barbed wire for fencing imported into Cuba. The Law received the President's assent on the 15th ult., and was to come into force on the 26th ult. The following are the duties leviable under the new Law:—

	Duty per head. Dollars.
Ewes; cows suitable for breeding purposes; cows with calf; heifers; oxen of the Jersey, Guernsey, Devon, Durham, Hereford, Porto-Rican, and Argentine breeds, providing the importer proves their origin	Free
Yearlings	1
Fat oxen and steers:	
Florida, weighing more than 500 lb.	5
Honduras " " 600 " "	6
Mexican " " 700 " "	7
Venezuelan, Columbian, and other oxen and steers not specially mentioned, weighing more than 800 lb.	8
Lean cattle, <i>i.e.</i> , those which do not reach the above weights according to class	2
Stallions above standard height (150 cm. = 14½ hands); asses above 130 cm. (13 hands)	Free
Mares suitable for breeding	3
Other mares	15
Geldings above standard height	15
below	2
Mules " above	10
below	5

Barbed wire and staples for the construction of fences are to be admitted free of duty.

The exportation of cattle is prohibited.

A copy of the translation containing provisions as to the slaughter of cattle, etc., may be seen at the Commercial Intelligence Branch of the Board of Trade.

German East Africa.—ALTERATION IN EXPORT DUTIES ON LIVE-STOCK.—A supplement to the Tariff of German East Africa, recently issued by the International Customs Bureau,

states that the export duties on live-stock in those territories have been modified, and are now as follows:—

Cattle:	
Female	per head 20 rupees.
Male	" 10 "
Sheep and goats	" 2 "

The privileged treatment accorded to European vessels by the circular of the 13th October, 1897, is maintained. In consequence, animals taken on board during the voyage as supplies for such vessels are to pay only half the duties stated above. The same privilege applies to navigation on the lakes.

Netherlands.—IMPORTATION OF CLOTHES, LINEN, ETC., FROM CERTAIN PORTS PROHIBITED.—The Board of Trade are in receipt of information, through the Foreign Office, to the effect that a notice has been published in the Dutch *Official Gazette* prohibiting, on and after the 5th inst., the importation into or transit through the Netherlands of rags, clothes, and unwashed linen and bedding from Bombay, Calcutta, Cape Town, and Port Elizabeth (Cape Colony).

Passengers' baggage, in respect of unwashed linen and bedding, is included in this prohibition; but goods arriving from the ports named, which can be proved to have been originally forwarded from elsewhere, and to have been so packed as not to have been in contact with infected goods, are exempt from the prohibition, as also are goods destined for transit, the packing of which cannot be altered or tampered with in any way.

Portuguese Guinea.—ALTERATION OF CUSTOMS DUTIES.—The Portuguese *Diario do Governo* for the 29th July last contains the text of a Decree altering the rates of Customs duty payable on articles imported into Portuguese Guinea, as follows:—

Tobacco, leaf	per kilog.	30
" manufactured	"	70
Gunpowder	"	40
Arms and ammunition	10 per cent. <i>ad valorem</i>	

Alcohol and spirits	{ per hectolitre of } 50° strength	12,600
And for every additional degree	per litre	2'52

Wines and beer are to pay the rates given in the Decree of the 7th May last. Articles unenumerated above are to pay duty at the rate of 3 per cent. *ad val.* The general rate of export duty is reduced from 10 to 7 per cent. *ad val.*

* The present value of the milreis (1,000 reis) is about 3s. 6d.

Russia.—TEA IN TRANSIT TO SAMARKAND.—The *Petersburger Vidomosti* for the 17th/30th ult., states, on the authority of the *Turkestan Gazette*, that the Ministry of Finance has authorised the transit of tea to the recently opened bonded warehouse at Samarkand, *via* Batoum, Baku, and Krasnovodsk, under the same conditions as to other Customs-houses of Central Asia.

San Domingo.—TARIFF ALTERATIONS.—The *Gaceta Oficial* of the Dominican Republic for the 5th July last contains the text of a decree reducing* as follows the Tariff valuation of certain beverages fixed by the Customs Tariff of San Domingo:—

	Valuations.†
Brandies and similar spirits, in bottles	dozen 8 00
Beer, in bottles	" 2 00
Liqueurs, in bottle	" 7 00
(Proportionately in other receptacles.)	
White and sweet wines, common, in demijohns or casks	gallon 0 60
Do. do., in cases of 12 bottles	case 3 60
Generous or dessert wines, fine, such as burgundy, champagne, Cyprus, sherry, Madeira, port, Rhenish, etc.	case of 12 bottles 15 00
Common claret or red wines, in demijohns or casks	gallon 0 40
Do. do., in cases of 12 bottles	case 3 00
Claret or red wines, fine, in cases of 12 bottles	" 7 00

Samples of wine, not for sale, are exempt from duty.

* By a previous Decree the valuations of all beer, wine, and spirits were doubled. The valuations here given are reductions only in comparison with these doubled rates.

† The nominal value of the Dominican peso is 4s.

‡ Duty is levied on these valuations at the rate of 50 per cent., excluding surtaxes.

TRANSPORT AND FREIGHTS.

The Freight Market.—Outwards, the chief feature has been the American demand for coal in consequence of the United States miners' strike. A considerable amount of business was done at 9s. 6d., but with the termination of the strike all orders have been withdrawn. Rates were not materially affected in other directions, and recent Welsh fixtures have been on basis of 3s. 9d. Malta, 5s. Genoa, 5s. 3d. Alexandria, 5s. 3d. Port Said, 5s. 6d. Venice, 6s. Las Palmas, 10s. River Plate, 11s. 6d. Rio. One or two steamers taken for rails to San Francisco at 24s. American markets have been surfeited with coal-laden tonnage. Northern Range to c.f.o. quoted at 1s. 6d. Australia has taken two boats for wool at 21s. 6d. to 22s. per 40 cu. ft. Newcastle-Manila taken several steamers at 10s. to 12s. Westport-Hong Kong done at 12s. Black Sea dull, and rates have fallen 6d. to 1s. Azoff quoted at 11s. Eastern markets are rather firmer. Calcutta quoted at 21s.; Bombay, 13s.; Kurrachee, 14s. Mediterranean markets continue weak. River Plate steady at 17s. Several boats have been fixed for live-stock to South Africa.—WEDDEL, TURNER & Co., October 28th, 1902.

COLONIES.

British Railways in West Africa.—Mr. W. Bradford, chief constructor of the Sierra Leone railway, who left Liverpool on Saturday morning in the Elder, Dempster liner *Biafra*, for Freetown, made a statement to Reuter's Liverpool representative, in the course of which he gave some very interesting particulars of the progress which had been made with the railways in the Sierra Leone colony. Mr. Bradford's present intention is to inaugurate the work for the new mountain railway, a line which is to run from Freetown up the well-known mountain so prominently visible from the sea. The new line will be about five miles in length, and he expects to complete it within 12 months, notwithstanding that the gradient will be somewhat steep. It is anticipated that this line will be an important factor in improving the health of Sierra Leone. The Sierra Leone railway, Mr. Bradford said, is now open for traffic for over 80 miles up to Rotofunk, the place where the American missionaries were massacred during the native rising some years ago. In fact the line is now completed to Myumba, thence it goes to Bo, and from there on towards the frontier of Liberia. The railway enables commercial and missionary enterprise to be extended into the interior, and mission stations have been already established at Myumba. Mr. Bradford had several assistants with him. The *Biafra* had also amongst her passengers a very large party of men for the Gold Coast railway, the contractors being evidently determined to push on this important work during the coming dry season.

Natal.—DURBAN HARBOUR.—The *Natal Government Gazette*, of 9th September, publishes, for general information, the report of the Durban Inner Harbour Enquiry Committee, who were appointed to enquire into the requirements of the Inner Harbour of Natal, the future facilities required, and the best means of carrying out the same.

Under the heading of present requirements, the report states that the witnesses, though differing considerably on some questions, are in agreement as to the more pressing wants of the port, which may be summarised as follows:—

First, and by far the most important, is the necessity for improvement to the harbour entrance. This subject is, however, outside the scope of the enquiry.

Second.—More wharfage, more accommodation, special berths for regular lines of steamers and for special cargoes, more deep-water moorings, more storage room and stacking ground, facilities for boat builders and the fishing industry, and an area for repairing shops. Government cold storage, with a bonded cold store near a wharf, is very urgently required.

Third.—Greater despatch in dealing with, and removing, cargoes after landing. This embraces such subjects as deficient railway power to remove goods, including lack of shunting engines, and lack of mechanical appliances to save hand labour in transporting and moving cargo.

Fourth.—A large dry dock, and also slipways.

The Canadian and South African Line.—A Reuter message from Liverpool, dated October 18, stated that Messrs. Allan Brothers have informed Reuter's Liverpool representative that their steamer *Ontarian*, which inaugurated the service between Canada and South Africa by sailing on October 18 from Montreal, had a full cargo consisting of grain, provisions, lumber, dairy produce, and so forth. It is also understood that the Elder, Dempster liner *Melville*, which is the second boat, and is to sail on November 18, is also booked full, or thereabouts. The steamers are not passenger boats. It is the intention to go from Montreal and Quebec in the summer months, and from Halifax and St. John in the winter. The *Ontarian* goes to Cape Town, Port Elizabeth, and Durban, whilst the *Melville* is to call at Cape Town, East London, and Durban. The Furness Line steamer *Oriana* is to sail on December 18, and is the first boat to start from Halifax and St. John. The ports in South Africa to which cargo is taken are Cape Town, Mossel Bay, Algoa Bay (Port Elizabeth), East London, Durban, and Delagoa Bay. Each steamer is provided with refrigerator accommodation for perishable goods.

The Jamaica Fruit Trade.—The *Times* Kingston correspondent writes under date October 1:—Important developments have taken place during the past few weeks in connection with the Jamaica fruit trade with England. It was first announced that the Imperial Direct West India Mail Company had handed over the handling of its fruit cargoes to Messrs. Elder and Fyffes, an associated English company. This was soon after followed by the intimation that Messrs. Elder and Fyffes had abandoned its local fruit agency, and transferred the business of loading its ships to the United Fruit Company, the arrangement being that the United Fruit Company would do the work at cost and receive 25 per cent. of the profits. It has now been made public that this agreement has been abrogated in favour of a closer union. The United Fruit Company has purchased one-half of the capital stock of Elder and Fyffes, and the latter is to be worked as one of the associated companies of the American organization, which has now again, therefore, complete control of the banana trade in Jamaica and Central America. A minor development has been the transference of Constant Spring Hotel by the Imperial Direct West India Mail Company to a separate London company. All these arrangements have been effected in England. Local opinion is very much divided on the subject, but the movement is the natural outcome of events. The United Fruit Company, who have behind them an experience of 20 years, have been sending over bananas in increasing quantities to the United Kingdom, while the Direct Line have lately been threatening to invade Central America, and have actually sent one ship there; they have also been making enquiries in Dominica with a view to extension in that direction. When Mr. Preston, the president of the United Fruit Company, went over to England a few weeks ago he had no difficulty in arriving at a mutual understanding with Sir Alfred Jones, with the results already mentioned. An important factor in the question was the apparent inability of the local management of Elder and Fyffes to send fruit in fit condition into Bristol. Several losses were incurred from time to time, and on a recent trip of the *Port Antonio* the entire cargo of bananas had to be thrown overboard before Bristol was reached. There was also great difficulty in securing full cargoes for the new subsidiary service between the north side of the island and Manchester, and Elder and Fyffes were compelled to ask the United Fruit Company to load up their first vessels. These shipments were so successful, although the voyage was longer, that the advantage of having the agency in the hands of the United Fruit Company was demonstrated. It is believed that the result of the combination will be an enormous increase in the output of bananas. The United Fruit Company state that it means for them the opening up of a steady and profitable market for an additional 5,000,000 bunches of bananas. How it will turn out for the growers remains to be seen. They have met in conference and discussed the situation, and have formed a Fruit Growers' Union to protect their interests in the future, if necessary, but past experience of similar voluntary combinations in Jamaica affords little hope that the organization will fulfil the useful and practical purpose which it might very well serve.

FOREIGN COUNTRIES.

New Steamship Lines to Mexico.—A recent report of the United States Consul at Vera Cruz records the latest action of the Mexican Government in the establishment of steamship lines. According to this, it has granted a concession to Jose Gabriel Escalante, of Progreso, Yucatan, for the establishment of a line of steamers, to be called the "Yucatan Steamship Line," to ply between Progreso and New York, with the privilege of calling at Vera Cruz, Tampico, Galveston, New Orleans, and Mobile. The concessionary is authorised to organise a company, and the vessels employed must be owned by the concessionary or the company, or chartered for at least six months at a time. The Mexican mail will be carried free of charge, in compensation for which the vessels will be entered and cleared at any time, day or night, except national holidays. The owners of this line are authorised to have their own coaling depôts, either on land or pontoons, in the ports where their vessels touch. It is expressly stipulated that the concessionary or the members of the company shall be considered Mexican and shall be subject to Mexican laws only. The term of this agreement is for three years. In addition to this, announcement is made that another agreement has recently been entered into by the Mexican Government with the Franco-Chiapas Trading and Transportation Company, of Frontera, Tabasco, for the establishment of steam navigation between Mexican Gulf ports and one or more American ports, Europe, and South America, and also in the coastwise trade between Mexican ports. Vessels must be owned by the company, or, if chartered, the contract must be for not less than six months. The Mexican mail will be carried free of charge, in compensation for which the company will enjoy certain privileges, such as the entering

and clearing of their vessels at any time, day or night, except national holidays, reduction of 30 to 35 per cent. in tonnage dues, etc.; and, in compensation for the usual privileges reserved by the Government, the vessels of this company will pay only 50 per cent. of the charges of the health officer, the stock of the company will be exempt from all federal taxes except such as are required in the way of revenue stamps, and all vessels belonging to this company under the Mexican flag will enjoy the same privileges as any other Mexican vessels. The company is authorised to employ foreigners as masters and chief engineers on the vessels, whenever it is impossible to fill the posts with Mexicans, provided such officers shall pass an examination and be qualified under Mexican law. The company may establish its own coaling depôts, on land or on pontoons, and repair-shops at such port or ports as may be found necessary and convenient, and make contracts with established steamship lines or new ones to promote direct inter-oceanic traffic, and with railroads for direct transportation to all parts of the Republic.

The Railway Block in South Russia.—*The Times* Odessa correspondent writes, under date October 14:—The state of affairs on the Russian South-Western Railway system is daily, I might say hourly, becoming worse. The number of grain-laden vans, wagons, and trucks now blocked in the goods sidings below Kieff is 18,500, containing about 200,000 tons of grain. There seems little or no hope of getting rid of this extraordinary block until well on in November. Meantime the grain trade in the majority of the leading exporting centres in South Russia is suffering most severely. Not the least unsatisfactory feature of this year's block is the fact that the tarpaulins and other truck covers have given out, and consequently there are several thousands of open trucks laden with grain lying in the numerous sidings south of Kieff exposed to the rain. Not only is the grain trade very seriously disorganised, but the fruit and kindred trades are temporarily at a complete standstill. Hundreds of tons of valuable fruit consigned to the ports by up-country fruit growers have had to be sold for next to nothing at various railway sidings for cattle- and swine-feeding.

OFFICIAL AND COMMERCIAL CONTRACTS. UNITED KINGDOM.

Enniscorthy.—TENDERS are invited, until the 19th inst., for erecting a FUEL ECONOMISER, to be connected with present boiler. Particulars may be obtained from the resident medical superintendent, District Asylum, Enniscorthy.

Glamorgan.—TENDERS are invited, until the 6th inst., for the ERECTION of a FOG SIGNAL HOUSE, etc., at Nash Point, Glamorgan. Particulars (L1) may be obtained from Messrs. Corderoy, Selby & Corderoy, 21, Queen Anne's-gate, Westminster.

London.—TENDERS are invited, until the 18th inst., for the Supply and Delivery of one 50-Ton ELECTRIC Power Overhead Travelling CRANE, with Auxiliary 2-Ton Hoist, and for the Erection of the same in the Council's Electricity Generating Station at Greenwich. Particulars (L2) may be obtained from the County Hall, Spring-gardens, S.W.—TENDERS are also invited, until the 18th inst., for the ROADWORK and PLATE-LAYING required for the re-construction, on the conduit system, for electric traction of the South London Tramways. Particulars (L10) may be obtained from the Engineer's Department, County Hall, Spring-gardens, London.

Newcastle-upon-Tyne.—TENDERS are invited, until the 8th inst., for the SUPPLY and ERECTION complete of a New Triple-Expansion Direct-Coupled ENGINE, of 3,000 horse-power, at the Power Station, Newcastle-upon-Tyne. Particulars (L3. 35.) may be obtained from the general manager and engineer, Manors Power Station, Newcastle-upon-Tyne.

Swindon.—TENDERS are invited, until the 8th inst., for the SUPPLY, DELIVERY, and ERECTION of PUMPING PLANT for the Waterworks at Ogbourne St. George, Wilts. Particulars may be obtained from the borough surveyor, Town Hall, Swindon, Wilts.

COLONIES.

Malta.—TENDERS are invited, until the 14th inst., for the SUPPLY of CAST-IRON PIPES and IRREGULAR CASTINGS. Particulars may be obtained from the Public Works Department, in Malta, or the Crown Agents for the Colonies, Downing-street, London.

South Australia.—TENDERS are invited until the 10th December, for the SUPPLY of the following materials, delivered in bond, on wharf, Port Adelaide; wharfage to be paid by the Contractor: One sixteen tons overhead travelling crane, rope-driven, with driving gear, straining gear, pulleys, brackets, etc., complete (3 drawings, 2s. each); Four thirty-five tons overhead travelling cranes, electrically driven with motors, etc., complete (1 drawing 2s.). Particulars may be obtained at the office of the chief mechanical engineer, Islington, South Australia; also at the office of the Agent-General for South Australia, 1, Crosby square, London, E.C.—TENDERS are invited, until the 8th January, 1903, for the SUPPLY and DELIVERY of CARTRIDGE PAPER: 200 reams double crown, 30 in. by 20 in., weight 55 lb.; 100 reams imperial, 30 in. by 22 in., weight 60 lb.; 60 reams, 30 in. by 15 in., weight 41 lb. Particulars may be obtained from the office of the Inspector-General of Schools, Adelaide.—TENDERS are also invited, until the 8th January, 1903, for the SUPPLY and DELIVERY of 250 reams of PRESSING PAPER, Caledonian grey, 16½ in. by 20 in., weight 24 lb. Particulars may be obtained from the office of the Inspector-General of Schools, Adelaide.

FOREIGN COUNTRIES.

Belgium.—TENDERS will be received, up to the 21st inst., at the office of the Ministry of War, Rue Royale No. 5, Brussels, for the supply of LEATHER for the use of the army. Particulars may be obtained from the office mentioned.—TENDERS are also invited, until the 26th inst., by the Société Nationale des Chemins de Fer Vicinaux, 14 Rue de la Science, for the CONSTRUCTION of the section of the LINE from Courcelles to Tilly, on the local line from Courcelles to Incourt. Particulars (10d.) may be obtained at the office named and from M. Darteville, 18 Rue de Turquie, Saint Gilles, Brussels.

Egypt.—TENDERS are invited, until the 20th December next, for the SUPPLY of a small STEAMER for inspection work on the Nile and canals. Particulars may be obtained from the office of the Inspector of Irrigation, 3rd Circle, Alexandria.—TENDERS are also invited, until the 15th inst., for the SUPPLY of TEAK LOGS, SWEDISH DEALS, etc., for the construction of railway carriages and trucks. Particulars (2s.) may be obtained from Lieut.-Col. Western, R.E., C.M.G., Broadway Chambers, Westminster.

French Indo-China.—TENDERS are invited, until the 17th January, 1903, for the work of CONSTRUCTING METALLIC BRIDGES over the Son-Calo at Phu-Lo, and over the Song-Cong at Phu-da-Phut on the road from Hanoi to Thai-nguyen. Particulars may be obtained from the Inspector-General of Public Works for the Colonies, Ministry of the Colonies, Paris, or from the chief engineer, Rue Vong-duc, Hanoi.

Uruguay.—Consul A. W. Swalm reports from Montevideo that the Department of Fomento has published the official call for TENDERS for the CONSTRUCTION of the new SANITARY WORKS for Montevideo, which will comprise a tunnel cut in the rock, 1,278 metres (4,193 feet) long by 3.65 metres (11.9 feet) high and 3 metres (9.9 feet) wide; a principal collector of about 4,000 feet; and a second collector of nearly equal size, together with several auxiliaries, as set forth in the plans and specifications, which may be obtained by application to the Minister of Fomento in Montevideo, or to the Uruguayan legations in London, Paris or Berlin. Bids will be opened December 15, 1902, in Montevideo. The work is estimated to cost something over \$3,000,000.

COMMERCIAL LAW INTELLIGENCE.

Maintenance of Crew, etc.—This was a motion in the Chancery Division on behalf of CAPTAIN D. N. BERLINGERI, on behalf of himself and the crew of the Italian s.s. *Tergeste*, that the Vacation Judge might direct the Admiralty Marshal to forthwith sell as much of the equipment of the *Tergeste* as would realise £250, after payment of the Marshal's charges, to enable plaintiff to obtain food for the maintenance of the crew *pendente lite*, and also to make further advances on account of the crew's wages or, alternatively, that a commission might issue for the appraisal and sale of the *Tergeste*, the vessel not to be sold for less than the appraised value. The vessel left Genoa on the 2nd December last for Sulina, and arrived in the Thames on the 9th March, after having sustained serious damage. She was placed in Messrs. Rait and Gardiner's dry-dock, and overhauled and repaired, the cost amounting to over £4,000. As no money was forthcoming all the work on the ship was suspended in June. On the 28th July Messrs. Rait and Gardiner issued a writ against the ship for necessities. No appearance had been entered to the writ, but there could be no motion for judgment in the action until after the long vacation. The crew were still living on board, were clamouring for their pay, or for advances to remit home, and would not leave the vessel, while the master had no right to sell her without the intervention of the Court on account of the possessory lien of Messrs. Rait and Gardiner. The owner was of opinion that the bill for repairs would be more than the steamer was worth, so he had abandoned her and was making a claim on the underwriters. His Lordship (Mr. Justice Jelf) ordered that a commission issue out of the registry for the appraisal and sale of the *Tergeste*, all parties to be at liberty to bid at the sale. The proceeds of sale are to be brought into Court without prejudice to the question of Messrs. Rait and Gardiner's possessory lien, and to all other questions as to priorities. A sum of £250 is to be paid out of the proceeds of the sale to the solicitors appearing for the captain and crew, such sum to be brought into account when the amount of wages due up to 8th April and repatriation expenses are ascertained. The Admiralty Marshal is to make arrangements for the maintenance of the crew until the date of payment of the said sum of £250, the judge expressing the opinion that the crew were not entitled to the cost of maintenance after the date of the payment of the £250.

Musical Copyright Act: Important Decision.—An important judgment under the Musical Copyright Act was given by Mr. Curtis Bennett at the Marylebone Police-court last month. On the 4th of the month an application was made for the destruction of a number of copies of alleged pirated songs seized in the Kentish Town-road, at the instance of a music publisher's agent. Mr. Curtis Bennett refused to make the order for destruction, however, until the person from whom the music had been seized had been summoned, and thus been given an opportunity of being heard in his defence. It was argued by a solicitor appearing for the music publishers that a summons was not necessary under the Act, and that the practice at other Courts was for the magistrates to grant a certificate for the destruction of the music on being satisfied that it was an infringement of the copyright. Mr. Curtis Bennett said he held a strong opinion that a summons was necessary before he could so act, and he offered to grant one, but the offer was not accepted, and the application was then adjourned. Mr. Curtis Bennett, in a long written judgment, said the Act in question gave probably the largest powers ever granted by the Legislature to private individuals. There was, however, nothing in the Act as to the application for an order to destroy music being *ex parte*, and without that special power the application must be heard in accordance with the Summary Jurisdiction Acts and the person complained of duly summoned to appear at the court, when the order would either be made or refused. The contention in this case was that the person accused of hawking the music was not to be afforded the opportunity of demonstrating that the copies complained of were not an infringement and showing that he was entitled to have them returned to him. To say that these people were not to be heard in their own defence appeared to him to be amazing, and entirely at variance with the judicial procedure of the country, which had hitherto always considered no person guilty of an offence until his guilt had been proved. This Act was not for the public good, but for the good of private persons. There was nothing in music, as there was in meat, to require its immediate destruction. Under all these circumstances he must refuse to make the order for the destruction of the music asked for until the hawker of the music had been summoned; and he again offered the applicant a summons against the man whose address the constable took when he made the seizure. Mr. Rutland, solicitor, who was making the application, said he would not attempt to discuss the question, but would simply ask his worship to state a case. Mr. Curtis Bennett replied that he was quite willing to state a case.

Substitutes for Coffee.—The NATURAL FOOD COMPANY, of Patriot-square, Hackney, were summoned at Worship-street by the Commissioners of Inland Revenue for having sold a certain article as a substitute for coffee or chicory without the same being stamped with a label denoting the duty payable on the same. Mr. Hawkins represented the Excise, and Mr. Schultess Young, barrister, defended. Mr. Hawkins said the matter came before the Court as a test case, to have it decided whether the article in question came within the Inland Revenue Act, 1882, as liable to duty. The article in question was known as Brunack, and was put out and sold by the defendant company in quarter-pound packets. Under the Act, a substitute for coffee or chicory was liable to a stamp duty of ½d. per quarter-pound. Correspondence had taken place between the Commissioners and the company, the latter denying that the article was a substitute for coffee. Mr. Proctor, an analyst at the Government Laboratory, said that the contents of the packet had the appearance of coarse-ground coffee, was brown, and had the smell of coffee. He had analysed it, and found it to be roasted barley. Mr. Young, for the defence, said he thought there was a very great distinction between the intentions of the Act and the preparation in question. It was prepared as a beverage, and might be used by persons who could not, or should not, take tea or coffee. Cocoa was a beverage similarly useful, but he urged that no one suggested it was a substitute for coffee. If so, it would be dutiable, yet it was often taken instead of coffee. The magistrate asked the price at which the

preparation sold, and being told 10d., remarked that the shares of the defendant company ought to stand very high. He held that the production was a substitute, liable to duty, and imposed the nominal penalty of 20s. and three guineas costs.

BRITISH CONSULAR REPORTS.

Algeria.—The reports from the various British Consular officers in Algeria for the past year show considerable prosperity, although the volume of trade does not appear to have increased. Wine is now the largest industry in the province, and up to two years ago many large fortunes were made in it. But during 1900 and 1901 the abnormal yield in France kept prices low, and caused loss to the Algerian growers. In 1899 the export of Algerian wines was nearly a million gallons, while in the succeeding year it fell to a little over half a million. Another main Algerian product is alfalfa, which covers an area estimated at more than 12 millions of acres. The chief area in which it grows is called the Alfa Sea, and is 210 miles by 95. An acre produces, on an average, 8 cwt. after drying and sorting. The cutting, sale, and export are governed by special rules framed to prevent improvident and unskilful working. Algeria exports, also, large quantities of grain. In 1900 it sent abroad over 4½ million cwt. of grain, chiefly wheat, oats, and barley. Algerian barley is much in demand on the Continent for malting. As to agriculture generally, it is stated that improvements are slowly taking place in Arab modes of cultivation, the richer Arabs now appreciating the advantages of using French ploughs and a more careful selection of grain. Last year, 60 ploughs sent to different addresses from Philippeville were all for Arabs. The Vice-Consul at Philippeville draws attention to the marbles of Algeria, which, he regrets, are not more widely known. The quarries of Chemtoll, he says, produce the most beautiful onyx marbles in the world. The interior of the new town-hall at Constantine is decorated with them, and the grand staircase and reception rooms are lavishly adorned with the most delicately veined and coloured onyx. A new quarry has been discovered near Ain M'illa, from which he has seen specimens of pure white, rose, and yellow onyx quite uniform in tinting.

China.—THE TRADE OF MANCHURIA.—The report of the Commissioner of Customs at Niu-chwang for the past year states that Manchuria has recovered from its troubles, and has resumed the interrupted task of development. The Russians suppressed the piracy prevailing on the Liao River, so that the vast quantities of produce, especially beans, accumulated close to that stream were able to make their way down to the coast. Railways aided in reviving trade by bringing down produce and carrying imports inland, especially while the river was low and the Chinese required their draught animals on their farms. But when the winter came on the older modes of transport prevailed; the Manchurian railway is not yet able to cope with the requirements of trade, and goods sent by cart are more certain to arrive punctually. The river, however, remains the chief route for produce. "No one," says the Commissioner, "who traverses the great and wealthy plain of Central Lower Manchuria can think that any single, or even double, line of railway can carry away its vast productions and bring in its large requirements, as well as deal with the passenger traffic, foreign and native, which is already a prominent feature of the Russian line. . . . When the railways have carried all that their capacities permit, there will still remain ample freight for the river boats." The foreign imports amounted to 2½ millions sterling, and the foreign exports to over three millions. The principal goods arriving at the port in direct steamers are Japanese cotton goods and yarn, Indian yarn (a very large item), Japanese coal and matches, American flour, and Hong Kong sugar. Japanese coal is increasing very rapidly in Manchuria. The coastwise steamers carry large quantities of American drills, jeans, and sheetings. These three items formed a third of the total foreign imports of Niu-chwang. This trade in American piece-goods has grown with extraordinary rapidity in Manchuria. Next in importance comes Indian yarn, which seems to have captured the market, the English and Japanese yarns being in small favour comparatively. Native cotton cloth still plays the main part in clothing the people of the province, and it is to this quarter the foreign manufacturer must look to find his chief competitor. The Commissioner quotes, with approval, the remarks of the Blackburn Commission on the production of native hand-made goods:—"The sooner we drop the fond illusion that we, and other competing countries, clothe China's millions, and grasp the fact that, as regards the trade in foreign piece-goods, every province of the country is an undeveloped market, the more hope shall we have for the future of our trade in the Far East. The fact is, we do not clothe China's millions; they clothe themselves, the purchasing power of the individual deciding whether he does or does not wear garments made from foreign cotton." In Manchuria the people are comparatively prosperous, and probably use more foreign piece-goods in proportion than those of the 18 provinces.

Japan (Nagasaki).—BRITISH TRADE IN MACHINERY AND METALS WITH JAPAN.—The preponderance of British machinery and metals in the imports of these articles to Japan is shown in the last report of our Consul at Nagasaki. He says that, while all the cranes and drilling machinery were imported, without exception, from this country, the shares of the other exporting countries—Germany and the United States—in other classes of machinery were insignificant. The entire trade in metals also is, practically, in the hands of the British producer, although Germany and Belgium have a small share, the competition of the United States, which at one time appeared to be assuming formidable proportions, having entirely died out, except iron nails, in which that country has a monopoly. Of the total imports to Nagasaki last year, over 92 per cent. were British. Mr. Forster, however, says it is to be regretted that the British producer, apparently, still fails to grasp the importance of supplying an article of uniformly good quality and in accordance with the specifications of the purchaser. Thus, in the case of a large order for iron pipes that was recently placed in the United Kingdom, the goods were found on arrival to be, in numerous instances, defective. Cooling cracks, uneven casting, and rough finish were observable, and the pitch and sizes of the holes were, in many cases, not according to specification. As an illustration of the careless manner in which these pipes were manufactured, it was noticed that in some of the flanged pipes the depth of the neck behind the flange was much greater in one half of the circumference than in the other, showing that the two halves of the pattern were dissimilar. The superiority of British manufactured goods is generally admitted by Japanese purchasers; but the producers have only themselves to blame if, owing to such avoidable causes as this, orders in the future are placed in other countries.

Norway.—COMMERCIAL CONDITION.—From the reports of the British Consular officers in Norway it appears that the past year has not been a favourable one for trade and industry. There was some stagnation as a result of the financial crisis of 1899, and, for the first time since 1894, there was a considerable decline in the import and export trade. In agriculture the year was a good average one; but fisheries, one of the most important staple industries, proved bad, although the good prices obtained helped to improve matters somewhat. The industries generally have been depressed; ice exporters had a bad year,

and the earnings from shipping were less than usual. The total foreign trade was under 2½ millions sterling, against 26½ millions in 1900. The imports declined by over two millions and the exports by over half a million. Lower prices prevailed for coal, and barley, malt, wine, woollens, machinery, and some other articles were imported in smaller quantities. The exports of dried fish, herrings, timber, and cellulose were less also. The railway earnings, too, were smaller than in either of the two previous years. Labour suffered in proportion, and the ranks of the unemployed, especially as regards the building trade, were larger. The proportion of Norwegian trade absorbed by Great Britain in 1900, the latest for which there are full statistics, was 34·5 per cent., Germany coming next with 22 per cent., all other countries being less than 10 per cent. each. As to exports, almost exactly 40 per cent. is absorbed by timber and 20 per cent. by fish products. Ice is one of the important exports of Norway; last year the quantity sent abroad was 346,788 registered tons, by far the larger part coming to the United Kingdom. But the value of the total export has fallen from £258,570 in 1898 to £34,731 last year. The quantity consumed in the country is also considerable. "The ice trade is declining owing to exporters being obliged, through insufficient capital, to sell at ruinously low prices. Even the vessels employed in conveying ice do so under conditions that make it often doubtful if they can clear expenses." The export of granite to the United Kingdom has increased of late, especially that of hewn granite for paving stones. The catch of cod last year was 39½ millions, while the average for the four previous years was nearly 46½ millions. The manufacturing industries of the country have not flourished because of decreased consumption and foreign competition. A few years ago many factories were established around Christiania, but of these very few have shown stability in troublous times. The industrial population of Norway has grown steadily, and in the last 35 years the exports of manufactures have risen in value from £83,000 to nearly 2½ millions sterling. Seventy-five thousand four hundred and fifty-seven people were employed in factories in Norway at the end of 1900. The emigration from Norway last year was larger than for some years past, and amounted to 14,210. The chief imports to the country in 1901 were, in order of importance, coal, rye (the only two heads exceeding in value a million sterling), coffee, sugar (both just over half-a-million in value), barley, woollens, machines. The last three were between a-quarter and half-a-million in value. The main exports were timber and its products to the value of £3,354,726, and fish and various fish products £2,246,099.

Rumania.—COMMERCIAL REVIVAL.—The British Consular reports from Rumania speak of a distinct improvement in trade, after two years of distress and failure, and during last year the country regained, to some extent, the prosperity of the years preceding the failure of the crops in 1899; but another year of good harvests will be needed to complete the restoration. Good crops, especially maize (which is the crop specially affecting the peasant), mild-weather, which kept the ports on the Danube open to shipments all the winter, and the development of the port of Constanza all contributed to bring money into the country, and to diminish the stagnation in business that usually takes place in the winter. Rumanian securities have risen in almost every case, and business generally has improved, although the effects of the crisis are still felt. Bankruptcies, however, are less frequent, and credit is obtained more easily and on more advantageous terms. The petroleum industry is growing in importance, but it is still cramped by want of capital. Transport is not in a satisfactory state, for the railway charges for petroleum are high, tank wagons are scarce, and the projects for pipe lines are still in abeyance. It was expected at one time that there would be a large export of petroleum up the Danube to Bavaria, and arrangements were made for the towage of tank barges to Ratisbon, but the Hungarian Government enforced the new tariff at the Iron Gates, and since then the oil has gone by rail. The production in Rumania last year is estimated at 250,000 tons; there are about 50 refineries, one group, those of the Steana Romana, treating nearly two-thirds of the total amount of crude oil. Nearly all the sugar mills, distilleries, gas-works, and factories and public institutions of Rumania, as well as the State railway, use petroleum refuse as fuel. The timber export is increasing steadily, and has to some extent compensated Galatz for the loss of the grain trade, which has now gone to Braila. The Rumanian forests cover about one-sixth of the whole area of the country; the most valuable are the beech forests, then follow the different varieties of oak, then pitch-pine, fir, lime, elm, ash, and plane. Russia takes more Rumanian wood than any other country; it goes chiefly to Batum for use in petroleum drums. The oak sleepers used for the Congo railway were also Rumanian. From Braila last year about 9,000,000 qrs. of grain were exported (a little less than half being maize), over a million quarters from Constanza, over a million from Galatz, and over three and-a-half millions from Sulina. At Sulina there was a remarkable movement in shipping when the Rumanian harvest began to arrive, and the shipping trade has profited more than any other by the revival in Rumania.

United States (Chicago).—The Acting British Consul at Chicago has prepared an elaborate report on the cattle and meat trade of the United States, in the course of which he gives a detailed description of the processes of slaughtering and packing cattle and pigs in Chicago in the establishments of the great export packers. The population of the country is increasing at the rate of 1½ millions a year, and the export trade in meat must soon be affected by this steady increase in the home demand, which amounts to about 200,000 more cattle each year. Some recent figures give the total supply of cattle for meat in the country at 27,610,000. It appears that Argentina has more cattle and sheep per head of the population than any other country in the world, Uruguay following closely, Australia and New Zealand coming next. There is some doubt whether the cattle supply from the ranges in the United States can be increased in the future, for many of the ranges have been overstocked, others have suffered from drought and fire, and sheep are being bred in large numbers. The latter move in large flocks, and eat the grass so close that the range does not recover for some years, and the shepherds and cattlemen are in constant conflict. There are over 6½ million sheep in the country, chiefly in the western States; but it is thought doubtful whether they can be maintained at this high figure. The number of pigs is over 6½ millions. Mr. Erskine describes the methods of the stock yards, and gives statistics of the yards at the five chief centres—Chicago, Omaha, St. Louis, Kansas, and Sioux City—as regards cattle, pigs, and sheep. He also gives numerous figures relating to the business of the packing houses. The latter, it is said, make all their profit in cattle slaughtered out of the bye-products, nothing but the gastric juice being allowed to go to waste. These bye-products are valued at about £3 per head of cattle killed, and include albumen from the blood; buttons and bone objects of all kinds (including billiard balls) from the bones; combs, etc., from the horns; buttons and cyanide of potassium and neat's foot oil from the hoofs; gelatine and glue from the soft bones; oil from the fat, and fertilizers from the refuse of everything. Mr. Erskine enters in some detail into the treatment of these bye-products. The export trade in cattle declined last year; of the 392,884 cattle exported, 72 per cent. came to this country and practically the whole of the

remainder to other British possessions. The export of fresh beef was very nearly 302 million pounds, of which 98 per cent. came to this country; only the best kinds of American beef will pay in this trade. Of tinned beef over 66½ million pounds were exported, of which 77 per cent. came to this country. Of the total meat export of the United States, the British Empire takes 87 per cent., and 31 per cent. of the bye-products, and of the two combined 71 per cent.

FOREIGN CONSULAR REPORTS.

Ploughs in China.—North China, Mongolia, Manchuria, and that part of Siberia bordering on the Pacific, are destined soon to become consumers of agricultural implements, for several reasons, says the United States Consul at Niuchwang. First, the country is not, as a rule, thickly populated; this is especially true of Mongolia, Manchuria, and Siberia. Labourers are imported each season to assist in planting and harvesting crops. There exists, therefore, more of a disposition to save labour than is generally found in other parts of China. Second, all of this country is abundantly supplied with animal power. Ponies, mules, donkeys, and cattle are used in every way to relieve the burdens of men. There are few parts of the world where animal power is more generally used than here. Ploughs, harrows, rollers, carts, and various other crude machines, locally made, are in constant use. The hand tools and the methods in use in other parts of China for cultivating, harvesting, and marketing crops are not so extensively employed here. As the people are so well trained in the use of this animal power, and already use many crude machines, there will not be serious difficulty in introducing better appliances. Third, the country is generally cultivated in much larger fields than in middle and southern China, and the employment of improved machinery would involve no change in the nature of their industry. Fourth, the opening of the country by railroads will reduce the cost of getting products to market and at the same time increase the supply. While these more general features are conducive to the introduction of agricultural machinery, it must not be understood that there are no difficulties. Above all other considerations, the plough must be cheap, as cheap as it is possible to make it. The form must differ very little from that now in use by the natives:—short beam, single handle, and as simple of construction as possible. The value of an improved plough will lie in deeper plowing with the same power. This would have to receive practical demonstration in every hamlet, and care should be taken to avoid some superstition, which might be done by giving the plough a favourable name. In Northern Manchuria, near Harbin, where there are several modern flour mills, better ploughing is done and from three to five mules or ponies are hitched to each plough. It is at this point that the effort to introduce the plough would be most successful, and thrashing and cleaning mills would also be most easily introduced here. The field should be carefully studied, and, in order to satisfy the prejudices of the people and create a market, implements should be designed especially for this territory.

Rubber Exports from Para.—According to the final returns, the shipments of rubber from the Amazon Valley last season amounted to 29,997 tons, or 2,317 tons more than in 1900-1901. In the present season, it is believed that a record-breaking crop will be harvested. The rubber fields of the lower river, and especially on the islands, are slowly but surely failing, both in quantity and quality; but the decrease is more than made up by the development of new fields and the expansion of the old fields on the Upper Amazon. While all the more important tributaries of the Amazon are supplying their full quota of rubber, and even making a promising increase, interest will focus in the now famous Acre territory, and in south-eastern Ecuador. In the regions reached by the Purus (of which the Acre is a tributary), Jurua, Beni, Madre de Dios, Javari, Ucayali, Japura, and other great affluents of the Upper Amazon, which penetrate Peru, Bolivia and Ecuador, there are illimitable rubber forests as yet unexplored, which will now be gradually developed. Many seringueiros, or rubber gatherers, are headed for these regions, and it is reported that several syndicates are about to begin operations in new fields in Bolivia and Peru. Bolivia continues to offer inducements for the colonisation and development of her vast area of rich rubber and mining territory. The United States Consul states that the Government of the State of Amazonas has granted the exclusive privilege of receiving, cutting, and packing all the rubber produced in that State to one wharf company. The creation of this monopoly will injure the rubber trade of this region, but Peru, Bolivia, and Ecuador will be the beneficiaries, as rubber growers and gatherers here are seeking to escape the new restrictions, which entail considerable expense and trouble upon exporters.

Balata Gum in Brazil.—The attention of interested parties in the United States has recently been directed to the possibilities of the Balata fields on the Amazon. James A. Bouty, for many years a gutta-percha operator in the Guianas, on a trip of investigation through this region about one year ago, found the balata tree growing in abundance near Para and on the Amazon and its tributaries for thousands of miles. The Brazilians had no knowledge of its gum-producing qualities. After persistent effort Mr. Bouty succeeded in interesting parties in the United States and Para, bought a concession, and has lately begun the practical work of producing gutta-percha for the market. Sufficient time has not yet elapsed to demonstrate the commercial value of Mr. Bouty's personal experiment, but his work has served to open up a new industry for Brazil, which may develop into large proportions. As in the case of rubber, there is practically no limit to the supply of gutta-percha on the Amazon, and, as it can be produced at a fraction of the cost of rubber, it offers a much higher percentage of profit. The United States Consul gives the following report on this subject from Mr. William Gerdeau, who has had a practical experience of many years in the Guianas, where he represented American and English gutta-percha importers and managed balata estates:—

The balata or bulle tree (*Minsaps balata*), grows in great abundance throughout the Amazon valley, but up to this time no attempt has ever been made to introduce the gutta-percha trade in this country. For more than thirty years, this trade has been carried on with immensely profitable results in the Guianas and the Orinoco valley, but those fields are now almost exhausted, and very little gutta-percha has recently been shipped. It is my opinion that this balata trade can be made to rival the rubber trade in this country, as it can be produced here in unlimited quantities, and its quality is, if not better, at least as good as the Guiana balata. I have found the balata trees scattered and in groves, sometimes amounting to forests many miles in extent, all over the States of Para and Amazonas, and I am informed on trustworthy authority that vast areas of these trees are growing on the Purus and Acre rivers and other tributaries of the Upper Amazon river. The method of bleeding the balata tree is entirely different to that used to extract the gum from the rubber tree, and only experienced and expert bleeders can be employed. But, on the other hand, these trees yield many times as much sap as the rubber trees, and one man can easily produce as many kilograms of gutta-percha in a day as twenty men can extract of rubber. The trees will average

3½ pounds of gutta-percha each, and a competent bleeder can prepare 40 to 50 pounds per day. The gum is first fermented and then dried in the sun, after which it is ready for shipment. Concessions of balata fields of any extent can be readily secured from the Brazilian Government, and private balata lands can be purchased for a fair price. It only requires some capital and practical knowledge of the business to develop one of the greatest industries in Brazil.

Trade Openings in Cuba.—Minister H. G. Squiers, of Havana, sends the following suggestions apropos to trade with Cuba: American manufacturers have either not studied or not heeded certain indispensable requirements to gain and retain the cotton goods trade in Cuba. They rely mainly on the export commission houses in New York engaged in Spanish-American trade to secure business for them here. Once in a while they send one of their representatives to Cuba, to work up trade, and he is generally one who does not speak Spanish, and must, therefore, transact his business through interpreters. The following requirements are noted: Special and careful packing, giving exact and minute details of goods in the invoices or on a separate memorandum attached to invoices. They should specify marks and numbers of packages and gross and net weights. The net weight of each separate class of goods contained in a single case should be specified; how each is packed, whether without wrapper or with paper wrappers or pasteboard boxes, and the net weight with or without wrappers or pasteboards; the total number of pieces each class or quality; the total number of yards, price per yard; width; whether white, crude, printed or manufactured with dyed yarns, and whether mixed with wool, silk or linen. European houses are liberal in the matter of credits, and it should be observed that failures are rare among the textile importers of Havana. The British have the largest part of the cotton-goods trade. Spain and the United States are close rivals, Spain surpassing the United States in some lines, notably in knitted hosiery and underwear. Spain does a thrifty trade with Cuba in wines, of which the United States might secure a share for its Californian products, if they are properly introduced. Spain also ships a considerable quantity of hams and sausages to this market. Too much importance cannot be attached to labelling and advertising goods in the Spanish language.

Peat v. Coal in Canada.—The United States Consul at Stratford (Ontario) reports that hundreds of thousands of dollars have been expended during the past few years in experiments by the different companies in the province of Ontario for the perfection of machinery to turn out a fuel that will compete with coal. The whole question of making the inexhaustible beds of bog commercially valuable lies in the drying process. The genius who will invent a machine to satisfactorily extract the moisture from crude peat will not only make a fortune, but will be a public benefactor.

Thus far, the nearest solution to the problem lies probably in the machine invented by Mr. Dobson, now in use at his peat works at Beaverton, near Lake Simcoe, in Northern Ontario. This machine consists of a press, drier, and spreader, and is a most ingenious contrivance, for it cuts, pulverises, and spreads the material at the same time. This reduces the moisture 50 per cent., and the balance is taken out by the drying process. The machinery in operation at this plant has a capacity of 20 tons a day. The bogs are three miles from a railway, and yet the demand for the fuel is such that it brings 13s. 6d. a ton at the plant and is retailed at Toronto at 17s. 8d. The plant near Stratford now has a daily capacity of 25 tons and a ready sale for all the fuel it can produce. It is run night and day, with a view to supplying the demand caused by the scarcity of hard coal.

Canada annually consumes nearly 3,000,000 tons of anthracite coal, all of which comes from Pennsylvania. Most of this is delivered during the summer months. The prolonged strike has changed the situation to such an extent that this summer no coal was delivered, and a serious fuel famine confronts the people of that latitude. This condition of affairs has given a tremendous impetus to the manufacturing of peat for fuel all over the province, and will probably lead to the perfection of inventions, so that crude bog will, in course of time, be the leading fuel and to a large extent take the place of hard coal.

CHAMBERS OF COMMERCE REPORTS.

UNITED KINGDOM.

Birmingham.—At a meeting of this Chamber on the 22nd ult., a letter was read from the secretary of the London Chamber stating that he was desired by his municipal trading committee to ask whether, having regard to the important issues raised by the opposition to the municipalisation of the Birmingham tramways which had been initiated by the Birmingham and District Trade and Property Association and others, it might be possible for the Birmingham Chamber, on broad grounds of public policy, to give the association its valuable support. The letter adds that "public attention has recently been drawn to the matter by reason of the growing indebtedness of local authorities, which is a serious matter for traders who are ratepayers, and it is submitted that, pending an enquiry, it is highly undesirable that local authorities should seek for further powers or that Parliament should confer them."

Mr. E. M. Carter said he thought that was a remarkable letter for the London Chamber of Commerce to send to them. The question of municipalising the Birmingham tramways was one of purely local interest, and he did not see why the London Chamber should attempt to interfere. One could not help thinking there was some other underlying motive besides the broad grounds of public policy referred to in the letter. Examining the constitution of the London Chamber of Commerce, he found there was at any rate one member who was very closely connected with and interested in certain electric tramway companies, and it appeared to him that another interpretation of the letter, besides the ground of public policy, might be that it was an attempt to cripple the hands of the Corporation of Birmingham in negotiations they might have to conduct with one of those electric tramway companies.

Mr. J. W. Tonks said it was easy to assume personal motives, but what the London Chamber of Commerce had done in this matter was in pursuance of its policy of bringing about the careful consideration by corporations and chambers of commerce throughout the country of the main question of municipal trading and its possible dangers. That was a fair proposition. He thought it was gratuitous, and rather unfortunate, that at the beginning of a discussion of that sort a gentleman should tell them some person was interested in a particular tramway company. So far as he had seen at the meetings of the association of chambers of commerce, this had been a perfectly *bona fide* movement, and he was not aware that anything had been done by any American capitalist or any American concern in order to influence the votes of the chambers.

Mr. Arthur Chamberlain said the Birmingham Chamber represented the trading interests of Birmingham, and it should be sufficient for them to act when Birmingham traders called their attention to any wrong from which they were suffering. He thought they would be going out of their way and making useless work for themselves in considering the question of municipal

trading. At the same time, he objected very much to imputing motives. But it was too ridiculous for the London Chamber of Commerce to ask the Birmingham Chamber to give some local society their assistance, and he did not think the latter could mean that.

Eventually, it was resolved, on the motion of Mr. Carter, seconded by Mr. Hills, "That this Chamber is not prepared to take any action in the matter."

Dundee.—At the meeting of the Chamber held on the 24th September, Mr. A. B. Gilroy, the President, occupied the chair, and, in moving the adoption of the minutes, detailed the transactions of the directors relative to Mr. Renshaw's Bill concerning the rating of machinery. The Bill, he said, had been amended in Committee in a perfectly satisfactory manner, and the passing of the measure ensured that the law relating to the rating of machinery was to be construed only to include machinery which was used for transmitting first motive power, and for the heating and lighting of buildings. All other machinery was exempt, which was just what they desired to have established by law. He referred to the unusual circumstance that the Bill was passed through Parliament and received the Royal Assent within the short space of about one month, and, following the passing of the Bill the Assessor of Taxes in Dundee, who had issued new valuations on several mills and factories, withdrew these increased valuations, and reverted to what had formerly been in existence.

Concerning the contemplated subsidising of the Canadian Pacific Railway Company to enable them to establish a fast mail service and a service of cargo steamers between this country and Canada, the directors, while holding to the view that there was everything to be said in favour of Government doing all they could to encourage a fast mail service of the kind, were of opinion that there were very great objections to Government subsidising cargo steamers. To subsidise any shipping line or any combination of lines in this respect would be most harmful to British shipowners trading with Canada. The Shipping Committee had met, and had recommended the directors to send a representation to the Government Department protesting against subsidies being given to cargo steamers. Similar representations had gone to the Government from other Corporations, and the Government had replied that they would receive consideration. They understood that before anything was done the whole matter would be submitted to Parliament. With regard to underground telegraph wires, they had urged upon Mr. Austen Chamberlain the necessity of extending the system to Scotland. They had received from Mr. Chamberlain's secretary the following communication:—"Mr. Austen Chamberlain desires me to thank you for your communication of September 22. I am to add he is giving special attention to the question of the extension of underground cables to the North." It was very satisfactory to know that the Postmaster-General was taking an interest in a matter which was of so great importance to the commercial interests of Scotland.

Speaking of the commercial education examinations which had taken place during the last quarter, the President mentioned that last year they had 30 entrants, 13 of whom passed the examination. This year they had 136 entrants, with 73 passes. He had no doubt that as the advantages of possessing the certificate became more widely known they would have even larger entries and better results.

Liverpool.—COTTON TRADE WITH MOROCCO.—At a meeting of the African Trade Section of the Liverpool Chamber of Commerce on 14th ult., a letter was read from Mr. J. A. Doughan, of that city, commenting on a recent communication from the Rouen Chamber in regard to the admission of cottons to the eastern districts of Morocco, free of duty, through Algeria. Mr. Doughan said that would cheapen such goods enormously to the people in that part of Morocco, as it saved the cost of the long caravan transit by camels from the western ports. "It is easy to perceive," he added, "that the action of the French Government is intended as an object lesson to the Moors to show them what advantages would accrue to them under the sovereignty of France as compared with their position under the Government of the Sultan. The French have been carrying out a similar policy in the south of Tunis for some years in allowing the Tuaregs and other tribes of the Sultan to receive sugar and tea duty free, and this in order to divert the caravan traffic of the Western Sudan from the *Hinterland* of Tripoli and to draw it to the French colonies of Algeria and Tunis. So far as it affects British trade the policy is beneficial rather than otherwise."

Midland Chambers.—A joint meeting of the Chambers of Commerce of Birmingham, Wolverhampton, Walsall, Dudley, Kidderminster, and Worcester was held at Birmingham on the 8th ult., to consider the recent action of the railway companies, in relation to demurrage and the consignment of goods at owner's risk rates. Mr. F. B. Goodman, Chairman of the Birmingham Chamber, presided. The course adopted by the companies was strongly condemned, and it was urged that it was calculated, if persisted in, to inflict serious injury on local industries. Mr. Arthur Chamberlain proposed, Mr. D. W. Probert seconded, and it was resolved, that a committee should be appointed to further consider the railway companies' conditions for owner's risk rates, with power to confer with the railway companies, or to take such other steps as they may deem desirable, and report to a subsequent meeting of the conference. The resolution further recommended the commercial community not to sign the general agreement, for goods to be carried at reduced rates at owner's risk, pending the result of the negotiations with the railway companies.

Newcastle-on-Tyne and Gateshead.—Sir Charles Mark Palmer, M.P., presided on the 1st ult. over the annual meeting, at Newcastle-on-Tyne, of the Newcastle and Gateshead Chamber of Commerce. With regard to coal and foreign competition, he said it was a monstrous thing that a tax should have been put upon the export of coal, and, if the shipowners had joined the coalowners in their opposition to it, the Chancellor of the Exchequer might have attached more weight to the arguments against the tax. When trade became more generally depressed, and it became necessary to fight the development of foreign coalfields, with all their enormous facility for opposing British trade, the tax of 1s. per ton would have a very serious effect. Whenever a new budget was brought forward, they should lose no opportunity of trying to get the tax removed. Referring to the railway system of the country, Sir Charles said he had always taken a very strong course against railways because of their excessive tariffs and their lack of facilities. The railway system was a great bane to the country, the tariffs being higher than in any country he knew. Speaking of the necessity for commercial education, he said he was impressed by the consular reports he received from various parts of the world. Our representatives of trade and commerce abroad were failures because they did not know the language of the people, did not understand the trade and commerce, and were ignorant of the requirements of the people. Education should be given to remove these drawbacks to the progress of British trade abroad. Now that the war was over in South Africa there would be openings for trade with the Dutch population, who would naturally prefer to deal with German traders. German and American commercial colleges were being extended, and they should be extended in this country.

GENERAL INTELLIGENCE OF THE PAST MONTH.

October, 1902.

UNITED KINGDOM.

OCT. 1st : The Medical Session commenced. The Fisheries Conference was concluded. Death of Sir Alexander E. Ramsay. Death of Lieut.-General J. I. Morris, R.M.L.I.

2nd : The London School Board re-assembled and Lord Reay made his annual statement. Death of Sir C. W. Cuffe Burton. Death of Sir F. Mackenzie. Death of Lady Lewis. Death of Mr. E. J. C. Morton, M.P.

3rd : A manifesto was issued by the National Free Church Council, the Trade Union Congress and the National Education Association in opposition to the Education Bill. A meeting of Nationalists was held in Dublin to inaugurate a National Defence Fund.

4th : Lord Kitchener was presented with the freedom of the borough of Chatham. The Ecclesiastical Art Exhibition in connexion with the Church Congress was opened at Northampton. Death of Lord Sherard of Glotton.

6th : The Duke of Connaught presented war medals at Windsor to the 1st Scots Guards. The Amalgamated Society of Railway Servants opened their annual meeting at Swansea. Mr. S. C. Macaskie, K.C., was appointed Recorder of Sheffield, in the room of Mr. S. D. Waddy. Death of Canon Rawlinson. Death of General J. A. Fuller, R.E.

7th : The Church Congress was opened at Northampton. The Miners' Federation of Great Britain opened their annual Conference at Stockport. Death of Dr. J. H. Gladstone. Sir W. Laurier, the Canadian Premier, opened a new produce exchange at Liverpool. The Dairy show was opened at the Agricultural Hall. Death of Lieut.-General R. S. Baines.

8th : Mr. Andrew Carnegie was presented with the freedom of the City of Bath. Death of Mr. John Kensit. The tercentenary of the founding of the Bodleian Library was celebrated at Oxford.

9th : The King left Balmoral for North Berwick. A conference of Liberal Unionists was held at Birmingham on the Education Bill, Mr. Chamberlain presiding. Lord Roberts was presented with the freedom of the City of Winchester, and Lieut.-General Sir J. French with that of Bedford. Death of Lady Jerningham.

10th : The Irish Landowners' Convention met in Dublin. The King visited North Berwick golf links.

11th : The King returned to London from Berwick. Lord Rosebery unveiled a statue of Mr. Gladstone at Glasgow. Lord Roberts laid the foundation of the Victoria Memorial at Liverpool, and he and Lord Kitchener were presented with the freedom of the city. Rev. Canon J. A. Robinson, D.D., was appointed Dean of Westminster. Death of Canon Murray, rector of Chislehurst. Death of Lady Backhouse.

13th : The King took leave of Lord Kitchener, on his departure for India. Death of Lord Cranworth.

14th : The King visited Newmarket. Lord Roberts was presented with the freedom of the borough of Croydon. St. Denols Library, Hawarden, was opened by Lord Spencer. The National Union of Conservative and Constitutional Associations opened their annual conference at Manchester. The subscribers to the British School at Athens held their annual meeting.

15th : Mr. Balfour opened the new School of Technology at Manchester. The Prime Minister, Mr. Balfour, was entertained at a banquet at the Mansion-house. Meetings were held condemning the Education Bill. Lord Rosebery presided at the annual meeting of the London Topographical Society.

16th : Parliament reassembled. Mr. J. O'Donnell was suspended. Lord Rosebery addressed a meeting at the City Liberal Club, in favour of unsectarian education in schools maintained at the public expense. Death of the Countess of Carnwath.

17th : Lord Kitchener left London for Egypt. Mr. H. R. Mansel Jones was appointed a County Court Judge. Lord Londonderry addressed a conference of Chief Inspectors of Elementary Schools at the Board of Education.

18th : The King returned to London. Death of the Rev. Canon Maclean. Death of Sir Julian Danvers.

19th : A demonstration of reservists took place in Hyde-park.

20th : Princess Henry of Battenberg unveiled a statue of Queen Victoria at Weymouth. The National Free Labour Association opened their annual conference at Leeds.

21st : The Queen arrived in London from Denmark. Lord Raglan was sworn in as Governor of the Isle of Man. Sir E. W. Hamilton, Assistant-Secretary of the Treasury, was appointed a Permanent Secretary to the Board, jointly with Sir F. Mowatt.

22nd : Mr. J. Lockie (C.) was elected M.P. for Devonport. The Boer Generals arrived in London. Mr. Andrew Carnegie was installed as Lord Rector of St. Andrews. The Association of Municipal Corporations held their annual meeting. Death of Sir W. D. King. Death of Mr. John Faed, R.S.A.

23rd : Lord Roberts visited Portsmouth, and was presented with the freedom of the borough. The Home Secretary appointed a committee to enquire into the use of electricity in mines. Death of the Hon. Lady Biddulph.

24th : The King held an Investiture at Buckingham Palace. His Majesty accepted a bible prepared by the British and Foreign Bible Society in commemoration of the Coronation. Lord Rosebery presided at the first council meeting of the Liberal League. Mr. Andrew Carnegie was presented with the freedom of Dundee.

25th : The King and Queen made a Royal Progress through London, and were entertained at luncheon in the Guildhall by the Lord Mayor and City Corporation. The King approved of Mr. Chamberlain proceeding to South Africa to settle the affairs of the new colonies. Death of Dr. W. Vaughan, Roman Catholic Bishop of Plymouth. Mr. George Wyndham was elected Lord Rector of Glasgow University.

26th : The King and Queen attended a thanksgiving service in St. Paul's Cathedral for the recovery of the King from his illness.

27th : The King inspected the Brigade of Guards returned from South Africa. A conference was held at the Mansion House with regard to the Port of London, and a committee was appointed to consider the question.

28th : Canon Robinson was installed as Dean of Westminster. Sir A. Macdonnell was appointed Under Secretary for Ireland. Lord Peel presided at the annual meeting of the Central Temperance Legislation League. Mr. A. F. Warr, M.P. for the East Toxteth Division of Liverpool, accepted the Chiltern Hundreds.

29th : Major-General Sir L. Rundle was presented with the freedom of Dover.

COLONIES.

Australia.—11th : The Federal Parliament was prorogued. **New South Wales.**—1st : The jubilee of the Sydney University was celebrated. 2nd : The Legislative Assembly rejected a vote of censure on the Government. 20th : The Railway Commissioners were re-appointed for seven years. **Victoria.**—1st :

The elections resulted in a Ministerial majority of 36. 15th :

Parliament was assembled and Mr. Gillies was elected speaker. **Queensland.**—12th : Sir E. Barton and Sir John Forrest arrived at Brisbane. **South Australia.**—4th : The Government introduced a Bill providing for the construction of a railway from Adelaide to Port Darwin.

New Zealand.—2nd : A Bill was passed, granting the Midland Railway Debenture-holders £150,000 in satisfaction of all claims. 4th : Parliament was dissolved; the elections were fixed for Nov. 15. 7th : The Government accepted the tender of the New Zealand and South African Steamship Company for the new South African service. 11th : The Blenheim-Seddon railway was opened by Sir J. Ward. 25th : Mr. Seddon arrived at Auckland and was enthusiastically welcomed.

British West Africa.—2nd : Colonel Graves arrived at Freetown, and was sworn in as Acting Governor of Sierra Leone.

Canada.—2nd : A great influx of Americans into the North-West was reported. 10th : It was decided to establish a fast steamship service between England and Canada, beginning with 20-knot boats. 15th : Death of Sir J. G. Bourinot. 17th : Sir Wilfrid Laurier arrived in Canada. 20th : Mr. Tarte resigned his portfolio in the Ministry. 27th : 2,000 of the Duk-hobos abandoned their farms.

Cape Colony.—1st : In the Assembly Dr. Smart's motion for fresh legislation against sedition and boycotting was rejected. 2nd : The Assembly passed a motion for a committee of enquiry into the action of the Bond. 7th : The Government was defeated on the Thebens Irrigation Bill. 17th : The Assembly passed the War Losses Additional Compensation Bill. 20th : The annual contribution of the Colony to the Navy was increased to £50,000. 27th : The announcement of Mr. Chamberlain's visit gave great general satisfaction. The death of General Christian Botha, at Kokstad, was announced.

Natal.—4th : Martial law was repealed in the Colony.

Newfoundland.—8th : The Arbitration Court awarded \$800,450 to the Reid Newfoundland Company. 17th : A reciprocity Convention was concluded with the United States, admitting Newfoundland products into the States free of duty.

St. Helena.—3rd : Death of the Governor, Mr. R. Stern-dale, C.M.G.

Somaliland.—6th : The British Expeditionary Force under Col. Swayne received a severe check from the Mad Mullah at Erego in Italian Somaliland, and retreated to Bohotle. 20th : Reinforcements were despatched from Aden. 28th : Reinforcements reached Aden from Bombay.

St. Vincent.—16th : La Soufrière was again in eruption.

Transvaal.—4th : A political association was formed at Johannesburg. 7th : Lord Milner left Johannesburg for a tour in the Lydenburg and Zoutpansberg districts. 8th : A revised Customs tariff was issued. 14th : Lord Milner returned to Johannesburg. 17th : The Chamber of Mines at Johannesburg deprecated any increase of taxation.

INDIA.

2nd : The number of persons in receipt of famine relief was 250,000. 16th : The number on famine relief was 142,000. 17th : Lord Curzon gave a farewell dinner to Sir A. Power Palmer. 21st : Sir A. P. Macdonell and Sir W. Lee-Warner were appointed Members of the Council, in succession to Sir A. C. Lyall and Sir J. B. Peile. 22nd : Mr. R. T. Ritchie was appointed Secretary in the Political Department of the India Office, in succession to Sir W. Lee-Warner. 23rd : The number on famine relief fell to 121,000. 29th : The Maharajah of Jodhpur, the Maharajah of Bikanir, and the Nawab of Bahawalpur, offered troops for service in Somaliland.

FOREIGN COUNTRIES.

Argentina.—26th : President Roca opened the new harbour works at Rosario.

Austria-Hungary.—2nd : The negotiations in connection with the Ausgleich were delayed. 6th : Dr. von Körber, the Austrian premier, returned to Vienna from Budapest. 17th : Baron Spens von Booden, Minister of Justice, resigned.

Belgium.—6th : The Boer Generals arrived in Brussels. 11th : The National Committee of Miners passed a resolution to demand an increase of 15 per cent. in wages.

Bulgaria.—1st : The 25th anniversary of the Shipka Pass operations was celebrated. 4th : Count Ignatieff was enthusiastically welcomed at Sofia. 14th : The Government decided to suppress the Macedonian Committee. 28th : The Sobranje was opened.

Chili.—3rd : The Government announced the sale by auction, on December 26th, of a million-and-a-half acres of land in the vicinity of Punta Arenas (Sandy Point).

China.—27th : Yuan-Shih-Kai, Viceroy of Pechili, was appointed Minister of Commerce. Wu Ting Fang was appointed a Commissioner in the negotiations regarding new commercial treaties, in place of Shéng.

Colombia.—15th : News was received that Señor Marroquin, the President, had been taken prisoner by General Fernandez, who declared himself Dictator. 28th : News was received that General Uribe Uribe had surrendered.

Denmark.—6th : Parliament was opened. 8th : The premier, Dr. Deuntzer, submitted a Bill ratifying the treaty for the cession of the Danish West Indies to the United States. 22nd : The Landsting rejected the treaty for the sale of the Danish West Indies.

Egypt.—14th : The cholera epidemic continued to decline.

France.—5th :—The funeral of the late M. Zola took place in Paris. 6th : The miners' strike in Northern France continued to extend. 8th : The Miners' National Committee in Paris decided to declare a general strike. A conference was held in Paris relative to the Chinese Eastern Railway. 9th : Nearly 100,000 men were on strike in the mining districts. 13th : The Boer Generals arrived in Paris. M. de Bradsky, a Hungarian, was killed in a balloon accident in Paris. 14th : Parliament was opened. 15th : The Boer Generals left Paris for Berlin. 23rd : Rioting took place at Dunkirk among the dock labourers on strike.

French West Africa.—4th : A decree was published re-organising the general government of French West Africa, and increasing the authority of the Governor-General, M. Roume.

Germany.—3rd : The Tariff Committee concluded its labours. 7th : An International Congress, on the subject of the "White Slave" Trade, was opened at Frankfurt-on-Main. 8th : The German Emperor decided not to receive the Boer Generals. 10th : A Congress was held in Berlin to further German colonial enterprise. 13th : The National Liberal Party held its annual congress at Eisenach. 16th : The Boer Generals arrived in Berlin. 18th : The Emperor unveiled a monument to the Great Elector at Fehrbellin. 23rd : An international conference on tuberculosis was opened at Berlin. 27th : The Crown Prince of Denmark arrived in Berlin on a visit to the Emperor. 29th : The Emperor, accompanied by the Crown Prince of Denmark, visited the artillery range at Kummersdorf.

Greece.—3rd : The Chamber was dissolved, the elections being fixed for November 30. 4th : The Crown Prince met with a motor-car accident near Tatoi.

Haiti.—18th: The insurrection was suppressed. General Firmin, the rebel leader, fled from Haiti with about 200 followers.

Holland.—10th: Mr. Kruger's birthday was celebrated at Utrecht, the Boer Generals being present.—14th: Mr. Kruger left Utrecht for Mentone. The Hague Arbitration Court, in the question between Mexico and the United States, awarded the latter \$1,420,682.

Italy.—7th: Mr. H. White was appointed United States Ambassador at Rome.

Japan.—17th: Negotiations were made for establishing extensive trade relations with Russia. 27th: General Oku and three staff officers were selected to be present at the Delhi Durbar. 28th: An agreement was made by England, Germany, France, and Japan to refer to the Hague Tribunal the treaty clauses relative to perpetual leases to foreigners.

Palestine.—16th: An outbreak of cholera was reported at Gaza.

Russia.—6th: Cases of plague were reported at Odessa.

Servia.—14th: The Vitch Ministry resigned.—20th: A new Cabinet was formed, with M. Velimirovitch (Radical) as Premier and Minister of Public Works.

Siam.—7th: A convention was signed in Paris for the adjustment of all questions between France and Siam.

Spain.—20th: The first sod of a new railway from Madrid to Bilbao was cut at Burgos.

Switzerland.—26th: The general election of the National Council took place, showing a strong Radical-Democratic majority.

Turkey.—2nd: The Sultan ordered an increase of the military forces in Macedonia.—8th: An insurrection broke out in Macedonia. An irade was issued ordering the conversion of the 1886 Customs Loan.—20th: It was reported that Jankoff, the Macedonian rebel leader, had been captured. 27th: The British Ambassador requested the withdrawal of Turkish troops from the borders of Aden.

United States.—1st: Great scarcity of coal existed in New York, in consequence of the strike.—2nd: The new Atlantic Shipping Company was incorporated at Trenton, N.J.—3rd: President Roosevelt held a conference at the White House with a view to the settlement of the coal strike.—4th: Arrangements were made for large importations of coal from England and Canada.—14th: The coal operators agreed to the appointment of a commission to consider all questions at issue.—16th: The coal strike was ended, arbitration being accepted.

Venezuela.—17th: After seven days' fighting the revolutionists under General Mendoza were defeated by President Castro at La Victoria.

FORTHCOMING EVENTS.

UNITED KINGDOM.

London.—On the 3rd inst. at the London Institution, Professor Flinders Petrie will lecture on "The Earliest Kings of Egypt."—On the 8th the German Emperor is expected to arrive in England.—On the 9th inst. the King's birthday will be celebrated at all foreign stations.—Monday, November 10th, is Lord Mayor's day.—On the 19th inst. Lord Selborne will preside at a meeting at King's College in aid of the appeal for the endowment of the College. On the same date Sir W. H. Preece will address the opening meeting of the Society of Arts.

Reading.—On the 5th inst., a statue of the King will be unveiled at Reading.

FOREIGN COUNTRIES.

Egypt.—THE ASSUAN DAM.—Sir John Aird and Co. have received a telegram from their agent in Egypt, stating that the formal opening of the great Nile reservoir and dam at Assuan will take place on Wednesday, December 10, and not on December 9, as had been reported. It is definitely settled that the Duke of Connaught will perform the ceremony. The invitations, which will number about 400, will be issued by the Egyptian Government, and the guests will probably travel to Assuan in river boats.

Greece.—The opening of the exhibition to be held in Athens next year has been further postponed from the 15th March to the 25th March, 1903.

Peru.—The inauguration of the Exhibition of the Industrial Applications of Alcohol, at Lima, has been postponed until the 1st January, 1903.

Portuguese East Africa.—A permanent exhibition of manufacturers' samples will be opened at Lourenço Marques, Delagoa Bay, on 1st January next, under the auspices of Messrs. Bell, Bell and Co., a merchant firm of excellent repute, the Portuguese Government having made a free grant of land for the purpose. The project is induced by the consideration that the position of Delagoa Bay as the natural port of the Transvaal makes it the rendezvous of purchasers from up-country centres, and it is anticipated that large numbers of merchants and their buyers will pay constant visits there to replenish stocks, etc. To these visitors the exhibition cannot fail to prove a great centre of both attraction and usefulness. The charges for space will vary from £2 to £3 per foot frontage (3 ft. depth) per annum, at which very moderate rates a considerable amount of space has already been leased to English, American, German, and French firms. Messrs. Bell, Bell and Co., who are being energetically supported by the local Consuls, offer to act as manufacturers' agents, samples being carried by their travellers on periodical journeys, and circulars and price lists discreetly distributed. Full particulars may be obtained at the London office, 110, Cannon-street, E.C.

NAVAL AND MILITARY INTELLIGENCE.

NAVAL.

Captain H. J. May, C.B., has been promoted to the rank of Rear-Admiral, with seniority of September 22.

The *Magpie*, gunboat, will be paid off into the division of the Devonport Dockyard Reserve on November 7.

The Admiralty has announced the following retirement and consequent promotions:—

Admiral of the Fleet the Right Honourable Richard James, Earl of Clanwilliam, G.C.B., G.C.M.G., has been placed on the Retired List. Dated October 3, 1902.

Consequent thereon the following promotions have been made from the same date, namely:—

In pursuance of His Majesty's pleasure, Admiral Sir James Elphinstone Erskine, K.C.B., to be Admiral of the Fleet.

Vice-Admiral Sir Frederick George Denham Bedford, G.C.B., to be Admiral in His Majesty's Fleet.

Rear-Admiral the Right Honourable Lord Charles William Delapoe Beresford, C.B., to be Vice-Admiral in His Majesty's Fleet.

Captain the Honourable Hedworth Lambton, C.V.O., C.B., to be Rear-Admiral in His Majesty's Fleet.

Captain Charles James Norcock to be Rear-Admiral on the Retired List.

Admiral Sir Edward Hobart Seymour, G.C.B., O.M., has been appointed First and Principal Naval Aide-de-Camp to His Majesty, in place of Admiral Sir James Elphinstone Erskine, K.C.B., promoted to be Admiral of the Fleet.

The *Latona*, cruiser, Captain R. H. S. Bacon, D.S.O., was commissioned, on the 14th inst., at Portsmouth as parent ship of the submarines.

The *Good Hope*, cruiser, will be commissioned at Portsmouth on November 5 as flagship of Rear-Admiral W. H. Fawkes, who will assume command of the Cruiser Squadron.

The *Intrepid*, cruiser, Captain R. B. Farquhar, left Plymouth on the 14th ult. for the Mediterranean, where she will relieve the *Barham*, cruiser, Commander W. C. Pakenham.

The *Flora*, cruiser, is to be commissioned at Devonport on November 11 to relieve the *Phaeton*, cruiser, Captain E. J. Fleet, on the Pacific Station.

Rear-Admiral R. N. Custance has been selected for the post of Rear-Admiral in the Mediterranean Fleet, *vice* Rear-Admiral Burges Watson, deceased.

Captain H.S.H. Prince Louis of Battenberg has been selected for the post of Director of Naval Intelligence, to succeed Rear-Admiral R. N. Custance.

The Good Service Pension of £150 a year, vacant by the retirement of Captain C. J. Norcock, has been awarded to Captain G. W. Russell.

The *Drake*, armoured cruiser, is to be ready for commission at Portsmouth in January instead of December. This will enable the crew to have their Christmas leave before joining the ship.

The *Niobe*, cruiser, Captain J. Denison, will be paid off into the Devonport Dockyard Reserve on December 18, and the *Hogue* will be commissioned on the following day to take her place in the Channel Squadron.

The *Star*, torpedo-boat-destroyer, was commissioned at Portsmouth on the 13th ult. by Lieutenant and Commander R. W. Myburgh and the crew of the *Wizard*, torpedo-boat-destroyer, which was recently in collision with the German liner *Kron Prinz Wilhelm*.

The *Crescent*, cruiser, was paid off at Portsmouth on the 3rd ult. by Captain H. H. Campbell, and the crew went on 54 days' leave. According to the present arrangements the refit of the *Crescent* will be carried out at Portsmouth Dockyard.

The Admiralty have definitely selected the battleship *Venerable* as flagship of the second in command of the Mediterranean Fleet. The *Venerable*, which has been built and equipped at Chatham Dockyard, is to be ready to hoist the pennant shortly. She will be manned by a crew of 750 officers and men, together with a Rear-Admiral's retinue.

The Admiralty are about to ask private shipbuilders to tender for one or more of a new class of battleship, which will be the largest, fastest, and most heavily armed warships ever yet constructed. They will be of 18,000 tons displacement, as compared with 16,350 tons in the *King Edward VII.* class. One of these vessels will probably be built at Devonport, and the rest in private yards. The Admiralty are also asking tenders for four "scouts" of 3,000 tons, 23 knots speed, and good sea-going qualities.

The shipbuilding programme of 1902-1903 comprises two battleships, two armoured cruisers, two third-class cruisers, four "scouts," nine destroyers, and four torpedo-boats. The battleships are to be named the *New Zealand* and the *Hindustan*, the former being built at Portsmouth, and the latter at the yard of Messrs. John Brown and Co. at Clydebank. Two similar vessels having been named *Dominion* and *Commonwealth* in honour of Canada and Australia respectively, it was only natural that New Zealand and India should be similarly honoured; the first name is new to the Navy List, although there had previously been a *Zealand*, a capture from the Dutch.

Hindustan is not a new name, there having been at least two vessels bearing this designation, one of which is now part of the training establishment for naval cadets, the *Britannia* at Dartmouth. The cruisers and "scouts" are not yet arranged for, and the report that the two armoured vessels will be called the *Natal* and the *Newfoundland* is at least premature. The nine torpedo-boat-destroyers are to be built, the *Cherwell* and *Dee* by Messrs. Palmer at Jarrow, the *Kennet* and *Jed* by Messrs. Thornycroft at Chiswick, the *Welland* by Messrs. Yarrow & Co., the *Waveney* by Messrs. Hawthorn, Leslie & Co., the *Arun* and *Blackwater* by Messrs. Laird at Birkenhead, and the *Velox* by the Parsons Turbine Company. The nomenclature in the case of the destroyers follows that of the previous programme, all the vessels being named after rivers. The four torpedo-boats are to be built by Messrs. J. S. White and Sons, of Cowes.

Austria-Hungary.—The official trials off Pola of the new Austrian battleship *Habsburg*, showed a speed of 19.62 knots. A speed of only 18.5 knots was required by the contract. The vessel, which was built at Trieste, has an armament of 43 guns. Two sister ships are in course of construction.

France.—The *Patrie* states that the launch of the French cruiser *Kléber*, fully equipped with her engines, boilers, guns, and military masts, has proved to be a most unfortunate and expensive experiment, as the heavy weight borne by the hull when out of the water has seriously strained the sides of the vessel and weakened the whole construction. It is very doubtful as to whether the cruiser will ever be equal to the work for which she was built.

Japan.—It is reported in Yokohama that a scheme of further naval expansion has been decided on, involving the construction of four battleships, six first-class cruisers, and various small craft. The battleships are to be built in England, the cruisers in England, France, and Germany, and the other vessels in Japan.

Russia.—The *Kronstadt Viestnik* publishes the following particulars of the Russian Navy Estimates for 1903, to which have been added some figures for the previous year for the purposes of comparison. The total amount of the estimates is 104,417,791 roubles, or roughly 10½ million pounds sterling, against 98,318,984 roubles for 1902 and 67,050,000 roubles for 1898. The increase of over six million roubles, as compared with the estimates for 1902 is in the main attributable to an additional 3½ million roubles for shipbuilding, armament, and repairs of ships; and two millions additional for maintenance of men and expenses of ships afloat. The *Kronstadt Viestnik* also gives the following particulars of the new Russian cruiser *Otchakov*, which was launched in the presence of the Tsar at Sevastopol on the 4th ult. Her length over all is 439 ft. 7½ in.; on the water line 433 ft. 5½ in.; beam, 54 ft. 5½ in.; draught, with a full load, 20 ft. 7½ in.; displacement, 6,570 tons; engines, 19,500-h.p., supplied by 16 Norman boilers; speed for 150 revolutions, 23 knots; normal bunker capacity, 720 tons; special, 1,100 tons. In building her hull 2,000 tons of Siemens-Marten steel have been used. The thickness of her armour deck will vary from 2½ in. to 2½ in.; the thickness of the protection for her casemates will be 3½ in.; for her turrets, 5 in.; and for her conning tower, 5½ in. She will carry 12 6-in. guns of 45 calibres—four in turrets, four in casemates, and four with shields; 12 2.95-in. guns; six 1.85 in. Hotchkiss guns; and two submerged torpedo-tubes. She will be fitted with eight turbines worked by electric motors and capable of raising 3,800 tons of water in an hour, and also with four pumps for the circulation of water in

her boilers to the extent of 4,000 tons in an hour. She was begun on March 7, 1901.

Spain.—The *Diario de Barcelona* states that the committee appointed to consider the proposal to build what would be practically a new Spanish navy, has reported in favour of the construction of 12 battleships, ten cruisers, and 76 smaller vessels. The *Epoca* understands that the scheme of Generals Navarro and Ferrandiz is that which will be submitted to the Cortes. It includes the construction of ten battleships of 13,000 tons, six to ten cruisers of 3,000 tons, six torpedo-boat destroyers of 240 tons, 32 torpedo-boats of 130 tons and 40 of 70 tons, 20 gunboats of 300 tons for the protection of the coasts, the fishing, the Canary and Balearic Islands and Fernando Po; two training ships, mixed steam and sail, for cadets, and three sailing ships for training quartermasters and men. The cost of building these vessels would be from 20 to 24 millions sterling, and the ordinary annual charge for the navy would rise to between three and four millions. The chief disagreement between the members of the committee was as to the battleships, one proposal being that they should be of 14,000 tons displacement, and another that they should be from 8,000 to 10,000 tons.

MILITARY.

Viscount Kitchener, as at present arranged, will reach India and take over command of the Indian army on the 28th inst.

It has been officially notified that, until further orders, all cavalry regiments stationed in South Africa, are to be kept up to a strength of 700, all ranks.

Major the Hon. M. O'Brien, Northumberland Fusiliers, has been appointed Aide-de-Camp and Military Secretary to Lord Dudley, Lord Lieutenant of Ireland.

Colonel F. J. Graves, late 20th Hussars, has been appointed to succeed Colonel J. E. W. Caulfield, in command of the troops at Sierra Leone.

Colonel C. H. Bridge, C.B., has been appointed Director of Transport and Supplies, 1st Army Corps, and assumed the duties at Aldershot.

Major G. H. Thomas, R.A.M.C., who only recently returned from active service in South Africa, has been ordered to Bermuda.

Captain H. F. Crichton, Irish Guards, has been approved for appointment as A.D.C. to Lieut.-General Sir J. French, commanding the First Army Corps.

Lieutenant A. E. S. Clarke, Scots Guards, has been nominated as A.D.C. to Major-General A. H. Paget, commanding the 1st Division of the First Army Corps.

Lieutenant H. D. Pearson, and Second Lieutenant E. W. Cox, Royal Engineers, Chatham, have been selected for employment on survey work in connexion with the Barotseland Boundary Commission.

Captain S. L. Barry, D.S.O., 10th Hussars, has been appointed Assistant Military Secretary and A.D.C. to Lieut.-General Sir J. French, commanding the First Army Corps, and Captain A. Lawson, Scots Greys, A.D.C.

Captain J. T. Lutley, 5th Batt. Worcestershire Regiment, lately serving with the Imperial Yeomanry in South Africa, has been appointed extra A.D.C. to the Governor of the Cape of Good Hope.

Lieut.-Colonel J. H. Cowan, R.E., has been appointed a member of the Ordnance Committee, *vice* Lieut.-Colonel C. M.G. Bate, who has vacated on being selected to take up the duties of commanding R.E. at Belfast. Colonel Cowan has lately returned to England from Wei-hai-wei.

Colonel W. Peacocke, C.M.G., having become available for general duty on resigning his appointment on the Headquarters Staff in India, has been offered, and has accepted, the post of Colonel on the Staff, commanding R.E. in the Transvaal and the Orange River Colonies.

Colonel W. G. Morris, C.M.G., who, since July, 1900, has been Colonel on the Staff, commanding R.E., Cape Colony, has been appointed Civil Surveyor General of the Colony, and will be succeeded in his military appointment by Colonel C. Hoskyns, who was placed on half-pay from the Corps of Royal Engineers, under the five years' rule, in April, 1900.

Colonel E. O. F. Hamilton, C.B., on vacating the command of the 2nd Battalion Royal West Surrey Regiment, has been placed under orders for India, where he will take up the command of the Wellington District, Madras, where Colonel C. E. Harman, lately placed on half-pay from the command of the 2nd Battalion Connaught Rangers, officiates for him until his arrival. Colonel Hamilton will have the rank of Brigadier-General.

Veterinary-Colonel H. Thomson, C.B., Principal Veterinary Surgeon in India, has been selected to succeed Veterinary-Colonel F. Duck, C.B., as Director-General of the Army Veterinary Department, the latter officer having completed in June last the five years which are laid down as the limit of appointment under present conditions. Colonel Thomson will shortly arrive in England to take up his duties. Veterinary Lieut.-Colonel B. L. Glover, C.B., will officiate in India pending the appointment of a successor to Colonel Thomson.

Colonel Sir A. R. F. Dorward, D.S.O., R.E., who has been rendering valuable service in China, and was previously in command at Wei-hai-wei, has, on vacating command of the British troops at Shanghai, been selected for the appointment of Colonel on the Staff, commanding the troops in the Straits Settlements, with the rank of Brigadier-General. This command has been vacant since the beginning of 1900, when Major-General J. B. B. Dickson, C.B., left Singapore to take up duties in the field in South Africa.

Major-General Sir Alfred Gaselee, who has been on leave in England since vacating his command of the British troops in China, has obtained permission to proceed to India to take up the command of Lucknow District, Bengal, to which he was appointed in April, 1901, in recognition of his distinguished services in connection with the occupation of Peking. General Gaselee will be present and act as umpire at the Indian manoeuvres. On his assuming the active duties of his command in India, Major-General Sir William Meiklejohn, who has been officiating for him, will proceed home.

A considerable reduction has been carried out in the Staff establishment of China consequent upon the reduction of the British Forces. The following details have been officially approved:—Staff to be retained.—Major-General O'Moore Creagh, C.B., commanding; D.A.A.G., Captain D. C. Young, 1st Batt. 4th Gurkhas; D.A.Q.M.G., Major P. W. D. Drake-Brockman, 5th Bengal Light Infantry; D.A.Q.M.G. for Military Intelligence, Major A. W. S. Wingate, 14th Bengal Lancers; Intelligence Officer, Lieutenant R. S. St. John, 4th Punjab Infantry; Field Engineers, Captains R. E. Pictou and A. Rolland, R.E. (the latter only till forts are demolished); Director of Telegraphs, Lieutenant B. W. Mainprize, R.E.; Principal Medical Officer, Colonel P. F. O'Connor, C.B., I.M.S.; Provost Marshal Tien-tsin, Captain E. L. Swifte, 40th Punjab Infantry; Principal Ordnance Officer, Captain G. G. Wood, R.A.; Commissariat Officer, Captain F. W. Forteth, Supply Transport Corps; Assistant Commissariat Officer, Captain H. St. C. Muscroft, 1st Central India Horse; Senior Transport Officer, Lieutenant R. L. Birdwood, 2nd Battalion 1st Gurkhas. The railway staff will remain as heretofore until the transfer of the railways to the Chinese has been carried out.

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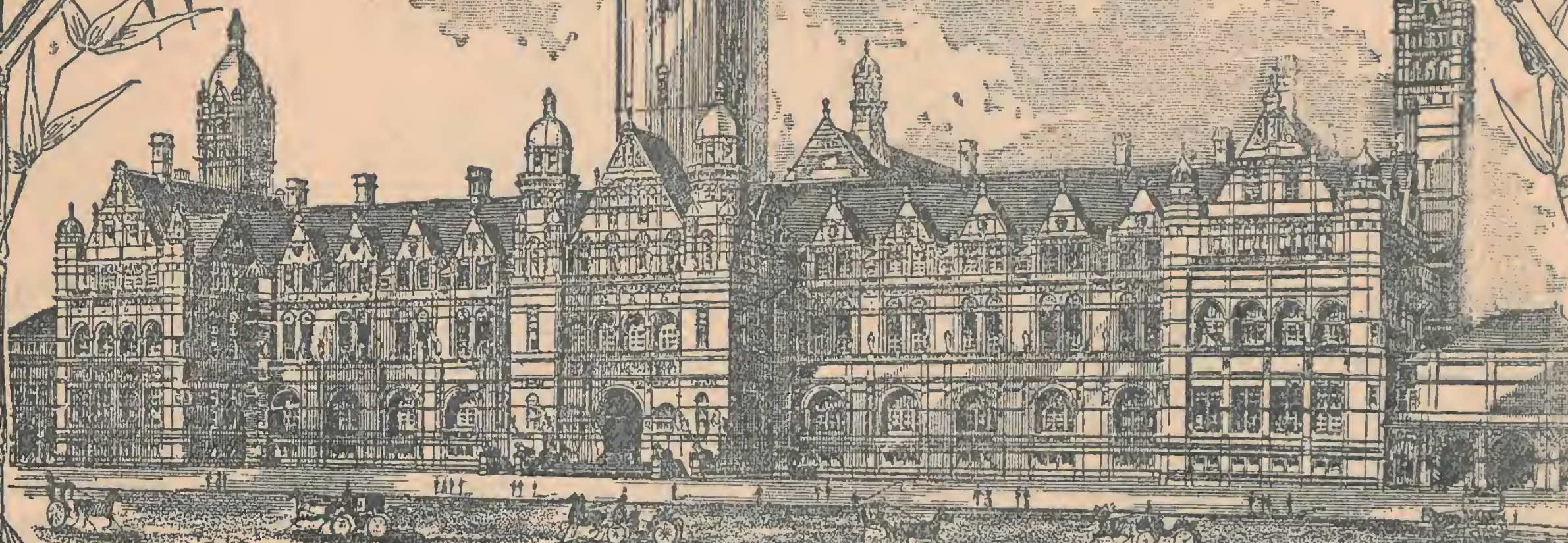
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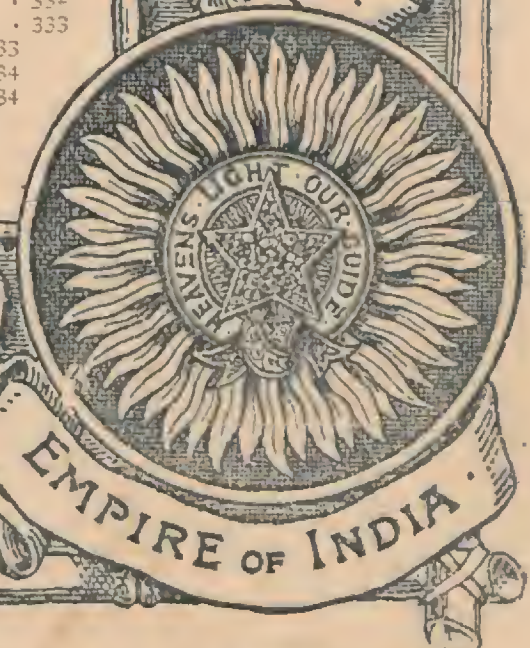
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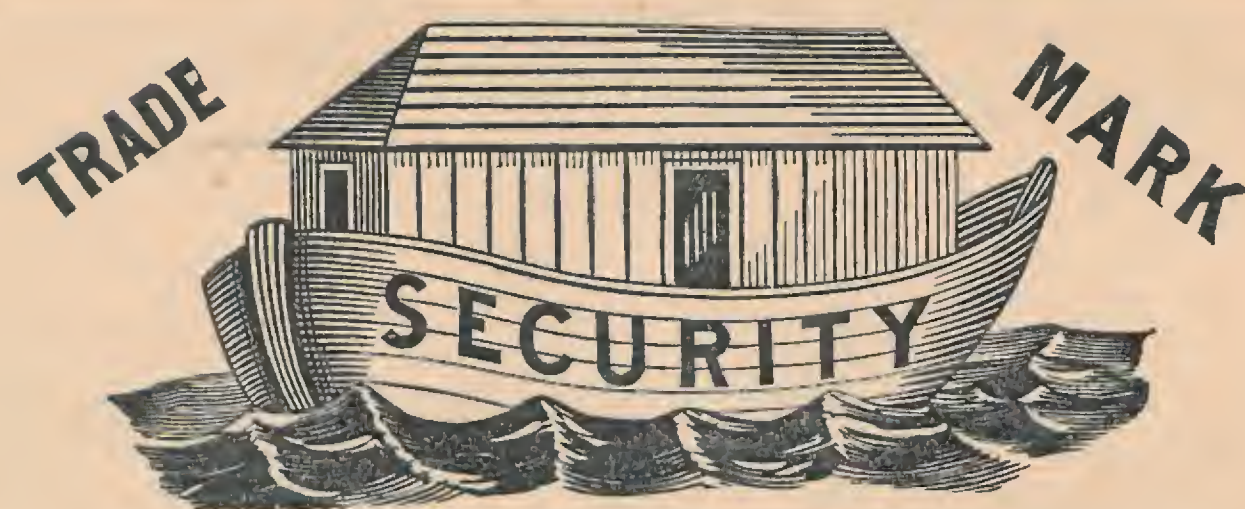
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Products Exhibited.—Agricultural produce, Angora hair, tanning barks, building stones, coffee, cutlery, indigenous timbers, minerals, coal, silk cocoons, spirits, sugar, tea, tobaccos, wine, wools, native ornaments, etc., etc.

RHODESIA AND BECHUANALAND.

(*West Central Lower Gallery.*)

Representative Governors.—Those of CAPE COLONY.

Curator of Collection.—Mr. LEWIS ATKINSON.

Products Exhibited.—Specimens of native workmanship kindly lent by the late

[Queen Victoria.

NYASALAND, BRITISH CENTRAL AFRICA.

(*West Central Lower Gallery.*)

Products Exhibited.—(By the British Central Africa Chamber of Agriculture and Commerce).—Coffee, ivory, *Landolphia* rubber, chillies, *Strophanthus* seeds, beeswax, photographs, etc.

BRITISH AMERICA.

(*West and Upper West Central Galleries.*)

DOMINION OF CANADA.

Representative Governor.—The Rt. Hon. the LORD STRATHCONA and MOUNT-ROYAL, G.C.M.G., *High Commissioner for the Dominion of Canada.*

Curator of Collections.—Mr. HARRISON WATSON.

PROVINCE OF QUEBEC.

Representative Governors.—The Rt. Hon. the LORD STRATHCONA and MOUNT-ROYAL, G.C.M.G., *High Commissioner for the Dominion of Canada.*

[ONE VACANCY.]

Corresponding Agent in Province.—The COMMISSIONER OF AGRICULTURE.

Products Exhibited.—Canadian furs from Hudson's Bay Co., stuffed birds, wood pulp, slates, vehicles, minerals (asbestos, apatite, mica, plumbago, etc.), agricultural produce, fruits, tobacco, maple sugar, timber, Indian ornamental work, cotton, linen, and leather, and iron manufactures.

THE COMMERCIAL COLLECTIONS OF THE INSTITUTE—*continued.*

BRITISH AMERICA—*continued.*

DOMINION OF CANADA—*continued.*

PROVINCE OF ONTARIO.

Representative Governors.—SIR HENRY TYLER and JOHN PATON, Esq.

Corresponding Agent in Province.—Mr. ARCHIBALD BLUE, Director of Mines, Toronto.

Products Exhibited.—Agricultural produce, preserved fruits, indigenous timbers, gold, silver, iron, lead, and nickel ores, petroleum, marble, granite and decorative stones, coal, native wines, honey, canned meats, and woodwork.

PROVINCE OF BRITISH COLUMBIA.

Representative Governor.—The Hon. J. H. TURNER (Agent-General).

Corresponding Agent in Province.—(At present through Agent-General's Office.)

Products Exhibited.—Agricultural produce, coal, Douglas fir and other timbers, minerals, preserved fruit, tinned salmon, fish oils, woodwork, birds, and animals.

PROVINCE OF NEW BRUNSWICK.

Representative Governor.—C. A. DUFF MILLER, Esq., Agent-General.

Corresponding Agent in the Province.—The PROVINCIAL SECRETARY.

Products Exhibited.—Timbers, minerals, building stones.

PROVINCE OF MANITOBA.

Representative Governor.—The Rt. Hon. the LORD STRATHCONA and MOUNT-ROYAL, G.C.M.G.

Corresponding Agent in Province.—The PROVINCIAL SECRETARY.

Products Exhibited.—Agricultural produce (including barley, beans, corn, oats, peas, rye, wheat, flour, &c.); birds, comprising ducks, grouse, partridges, snipe, etc.; heads of wapiti, caribou, moose and other large game; specimens of native workmanship, photographs, head-dresses, clubs, arrows, beadwork, etc., etc.

PROVINCE OF NOVA SCOTIA.

Representative Governor.—JOHN HOWARD, Esq., Agent-General.

Corresponding Agent in Province.—(At present through Agent-General's Office.)

Products Exhibited.—Minerals, samples of iron ore and products manufactured from the ore, wood-wool.

NORTH-WEST TERRITORIES.

Representative Governor.—THOMAS SKINNER, Esq.

Corresponding Agent in Province.—(At present through the Representative Governor.)

Products Exhibited.—Grain.

NEWFOUNDLAND.

(Upper West Central Gallery.)

Representative Governor.—[VACANT.]

Corresponding Agent.—

Products Exhibited.—Minerals (including ores of iron, copper, manganese, chromium, lead, antimony and zinc, molybdenite, mispickel, mica, asbestos, steatite, granite, marble, slate, coal, and petroleum) and timber.

BERMUDA.

(Middle of Central Lower Gallery.)

Representative Governor.—Gen. SIR ROBERT BIDDULPH, G.C.B., G.C.M.G.

Corresponding Agent.—THE COLONIAL SECRETARY.

Products Exhibited.—Arrowroot, woods, silk, shell-work, and sandstone.

WEST INDIES.

(West Central Lower Gallery.)

BRITISH GUIANA, TRINIDAD, AND TOBAGO.

Representative Governor.—The Rt. Hon. the LORD STANMORE, G.C.M.G.

Corresponding Agent.—Trinidad and Tobago: THE COLONIAL SECRETARY.

Curator of Collection.—(In charge of Institute Staff.)

Products Exhibited.—Arrowroot, cereals and pulses, medicinal barks, cocoa, coral, coffee, indigenous timbers, lace, fibres, rum, spices, starches, sugars, timber, leather, skins, drugs, fish glue, basket-work, condiments, etc.

JAMAICA AND BAHAMAS, WINDWARD ISLANDS, AND BARBADOS.

Representative Governor.—Field Marshal SIR HENRY W. NORMAN, G.C.B., G.C.M.G.,

Corresponding Agent.—Jamaica: THE INSTITUTE OF JAMAICA. [C.I.E.]

Hon. Curator.—[VACANT.]

Products Exhibited.—Arrowroot, barks, cocoa, coral, coffee, indigenous timbers, lace-bark, fibres, rum, spices, starches, sugars, sarsaparilla, wax, oils, condiments, turtle, etc.

BRITISH HONDURAS.

Representative Governor.—J. McMURRICH CURRIE, Esq.

Corresponding Agent.—[VACANT.] *Hon. Curator of Collection.*—J. M. CURRIE, Esq.

Products Exhibited.—Banana and cassava meal, cocoanut oil, coffee, horns (deer), indiarubber, Indian corn, medicinal barks, pickles, preserved fruits, rice, rope and cordage of native manufacture, rum, seeds edible and ornamental, spices, sponges, sugar, mahogany and other timbers, tobacco, etc.

LEEWARD ISLANDS.

Representative Governor.—[VACANT.]

Corresponding Agents.—Grenada: THE COLONIAL SECRETARY.

St. Vincent: THE ADMINISTRATOR. *St. Lucia:* MR. T. H. DIX.

Products Exhibited.—Arrowroot, barks, cocoa, coral, coffee, indigenous timbers, fibres, rum, spices, starches, sugars, etc., etc.

FALKLAND ISLANDS. (Middle of Central Lower Gallery.)

Representative Governor.—Gen. SIR ROBERT BIDDULPH, G.C.B., G.C.M.G.

Corresponding Agent.—THE COLONIAL SECRETARY.

Products Exhibited.—Wool, birds' skins and eggs.

BRITISH AUSTRALASIA.

NEW SOUTH WALES.

(East Central Upper and Lower Galleries.)

Representative Governor.—The Hon. HENRY COPELAND (Agent-General).

Corresponding Agent in Colony.—(At present through Agent-General's Office.)

Products Exhibited.—Minerals (including gold, silver, coal, &c.), wool, indigenous timbers, wines, cereals, seeds, gums, resins, oils, fibres, rope, leather, tallow, etc., etc.

VICTORIA.

(East Central Upper and Lower Galleries.)

Representative Governors.—[VACANT.]

Corresponding Agents in Colony.—(At present through Agent-General's Office.)

Officer in Charge of Collection.—Mr. A. G. BERRY (of the Agent-General's Office.)

Products Exhibited.—Animals, birds, coal, cereals, chemical manufactures, cigars, essential oils, gums, grain, hops, indigenous timbers, leather, leatherware, minerals (including auriferous quartz, coal, kaolin, etc.), models of gold nuggets, seeds, sugar, tobacco, wines, wool, etc., etc.

SOUTH AUSTRALIA.

(East Central Lower Gallery.)

Representative Governors.—H. A. GRAINGER, Esq. (Agent-General), and HENRY BULL TEMPLAR STRANGWAYS, Esq.

Corresponding Agent in Colony.—(At present through Agent-General's Office.)

Officer in charge of Collection.—Mr. EDMUND SNELL (of the Agent-General's Office.)

Products Exhibited.—Agricultural produce, wines, indigenous timbers, furniture, wool, etc.

QUEENSLAND (AND BRITISH NEW GUINEA).

(East Central Lower Gallery.)

Representative Governors.—The Hon. SIR HORACE TOZER, K.C.M.G. (Agent-General), and Field Marshal SIR HENRY W. NORMAN, G.C.B., G.C.M.G., C.I.E.

Corresponding Agent in Colony.—(At present through Agent-General's Office.)

Curator of Collection.—(In charge of Institute Staff.)

Products Exhibited.—Building stones, eucalyptus oils, fibres, minerals, pearl shells, indigenous woods, cereals, models of fruits, sugar, wine, tinned meats, hides, skins, leather, etc., etc.

WESTERN AUSTRALIA. (East Central Lower Gallery.)

Representative Governor.—The Hon. H. B. LEFROY (Agent-General).

Corresponding Agent in Colony.—(At present through Agent-General's Office.)

Curator of Collection.—(In charge of Institute Staff.)

Products Exhibited.—Wools, gums and resins, olive oil, fibrous barks, silk, skins, indigenous woods, minerals, model gold ingots, etc., etc.

TASMANIA. (East Central Lower Gallery.)

Representative Governor.—The Hon. ALFRED DOBSON (Agent-General).

Corresponding Agent in Colony.—Mr. T. C. JUST, Chief Secretary's Office, Hobart.

Curator of Collection.—(In charge of Institute Staff.)

Products Exhibited.—Cereals, minerals, models of fruits, stuffed fish, furs, timbers, illustrations of local manufactures, etc., etc.

NEW ZEALAND. (East Central Lower Gallery.)

Representative Governors.—The Hon. W. P. REEVES (Agent-General), and THOMAS MACKENZIE, Esq. *Corresponding Agent in Colony.*—(At present through Agent-General's Office.) *Curator of Collection.*—(In temporary charge of Institute Staff.)

Products Exhibited.—Agricultural produce, building stones, coal, Kauri gum, hemp and flax, tinned meats, wools, tobacco, Kauri and other woods, with illustrations of their application to structural and ornamental purposes; photographs, etc., etc.

FIJI. (Middle of Central Lower Gallery.)

Representative Governor.—Gen. SIR ROBERT BIDDULPH, G.C.B., G.C.M.G.

Corresponding Agent in Colony.—Hon. JOHN HILL, Suva.

Curator of Collection.—(In charge of Institute Staff.)

Products Exhibited.—Barks, fibres, copra, tea, cocoa, coffee, timbers, etc.

BRITISH INDIA (AND ASIA).

INDIA (East Gallery and Pavilion.)

Representative Governors.—Vide p. 312.

Special Committee, in charge of the Indian Section (appointed by the Secretary of State for India in Council):—*Chairman:* Major-General SIR OWEN TUDOR BURNE, G.C.I.E., K.C.S.I.

Members: SIR GEORGE C. M. BIRDWOOD, K.C.I.E., C.S.I.; G. W. VIDAL, Esq., I.C.S.; SIR E. C. BUCK, K.C.S.I.; W. COLDSTREAM, Esq., I.C.S., B.A.; C. H. MOORE, Esq.; T. W. HOLDERNESS, Esq., C.S.I.; SIR CHARLES J. LYALL, K.C.S.I., C.I.E.; Major-General JAMES WATERHOUSE.

Secretary: Mr. J. R. ROYLE, C.I.E.

Channel of Correspondence.—THE REVENUE AND AGRICULTURAL DEPARTMENT, INDIA.

Curator of Collection.—Mr. J. R. ROYLE, C.I.E.

Products Exhibited.—Fodder grasses, foods and food stuffs, sugar, spices and condiments, models of fruits, narcotics (including opium, ganja, etc.), tobacco and cigars, tea and coffee, oils and oil-seeds (including those of castor, sesamum, linseed, cocoa-nut and ground nut, etc.), a large assortment of drugs, dyes and tans, gums and resins (including the resins and turpentine of Indian pines, wax, lac, etc.), an extensive collection of fibres (including cotton, silk, jute, coir, reha, agave, etc.), models illustrating the manufacture of cotton and jute, minerals (including building stones, coal, mica, soapstone, corundum, iron ores, steel, etc.), timbers, collection of Indian pottery, carved woodwork, silver, brass and copper ware, silk and cotton fabrics.

CEYLON. (East Gallery.)

Representative Governor.—The Rt. Hon. the LORD STANMORE, G.C.M.G.

Executive Officer and Home Agent.—FREDK. H. M. CORBET, Esq., Barrister-at-Law.

Curator of Collection.—Mr. J. R. ROYLE, C.I.E.

Products Exhibited.—Cereals, pulses, edible fruits, roots and grains, spices and condiments, drugs, horns, skins, pearls, shells, wax, oils, gums, resins, dyes, tans, fibres, timbers, building stones, plumbago, metallic ores, rough gems, palm products, tea, coffee, cocoa, cinchona bark, sugar, tobacco, cotton-cloth, mats, rattan and basket work, wood and ivory carving, metal-work, pottery, tortoise-shell and porcupine quill work, lacquer work, lace, etc., etc.

STRAITS SETTLEMENTS (AND JOHORE).

(East Gallery.)

Representative Governor.—SIR CECIL CLEMENTI SMITH, G.C.M.G.

Corresponding Agents.—The COLONIAL SECRETARY (at Singapore); The Dato JAMES MELDRUM (for Johore). *Curator of Collections.*—(In charge of Institute Staff.)

Products Exhibited.—Barks, canes, drugs, fibres, preserved fruits (including Singapore pine-apples), mats, silk fabrics, oils and oil-seeds, dyes and tans, gums, gutta-percha, tin ores and other minerals, teas, coffee, spices, timbers, etc., etc.

MAURITIUS (AND SEYCHELLES).

(West Central Lower Gallery.)

Representative Governor.—[VACANT.]

Corresponding Agent in Colony.—Mr. A. DARUTY DE GRANDPRÉ, Museum Superintendent

Corresponding Agent for Seychelles.—The Hon. E. B. SWEET-ESCOTT, C.M.G., Administrator

Curator of Collection.—(In charge of Institute Staff.)

Products Exhibited.—Fibres, hemp, oils, rum, seeds, sugars, tortoise-shell, vanilla beans, with specimens of native workmanship, etc., etc.

HONG KONG. (Middle of Central Lower Gallery.)

Representative Governor.—SIR WILLIAM ROBINSON, G.C.M.G.

Corresponding Agent in Colony.—The HARBOUR MASTER.

Curator of Collection.—(In charge of Institute Staff.)

Products Exhibited.—China, carved and inlaid ivory and wood-work, silver and lacquer ware, silk and cotton fabrics, drugs, paints, dyes, food stuffs, etc., etc.

BRITISH NORTH BORNEO. (West Central Lower Gallery.)

Corresponding Agent.—(At present through the British North Borneo Co.)

Curator of Collections.—(In charge of Institute Staff.)

Products Exhibited.—Timbers, rattans, coal, rice, sago, sugarcane and raw sugar coffee, cocoa pods, pepper, tobacco, beeswax, camphor, gutta-percha, kapok fibre dammars, cutch and gambier, hemp, honey, etc.

BRITISH POSSESSIONS (EUROPE)

MALTA, GIBRALTAR, AND CYPRUS.

(West Central Gallery.)

Representative Governor.—Gen. SIR ROBERT BIDDULPH, G.C.B., G.C.M.G.

Corresponding Agent.—(At present through the Representative Governor.)

Curator of Collections.—(In charge of Institute Staff.)

Products Exhibited.—From Malta—Carved stone-work, lace, macaroni, honey, various fabrics, models, pictures, etc., etc. Gibraltar and Cyprus—None at present.

IMPERIAL INSTITUTE JOURNAL.

VOL. VIII. No. 96.

LONDON.

DECEMBER, 1902.

GENERAL NOTICES.

"THE IMPERIAL INSTITUTE JOURNAL."

The issue of the IMPERIAL INSTITUTE JOURNAL will cease at the end of the present year, when the Imperial Institute passes to the control of the BOARD OF TRADE. Most of the information at present supplied in this Journal will, in future, be found in the "Journal of the Board of Trade."

All correspondence relating to the various Departments of the Institute should, in future, be addressed to the Imperial Institute, as usual.

An ornamental red Cloth Cover, for binding the numbers of the JOURNAL for the year 1902 in one volume, may be obtained at the TICKET OFFICE of the INSTITUTE, or from Messrs. WATERLOW AND SONS LIMITED, Blomfield-house, London-wall, E.C., price 2s. 6d. An index and title-page to the volume are inserted in this issue of the JOURNAL. Bound yearly volumes of the JOURNAL, for the years 1895-1902, may be had at 10s. each.

IMPORTANT NOTICE

TO

ANNUALLY PAYING FELLOWS.

The Bill transferring the property and Government of the Imperial Institute to the Nation has become Law.

After the 1st of January, 1903—when the Act comes into operation—subscribing Fellows will cease to exist as such.

It is suggested that any standing orders that may have been given to Bankers or Agents for the payment of the annual Fellow's subscription should be cancelled. A continuance of the enjoyment of privileges of Fellowship will be secured to those now on the Roll of Life Fellows of the Institute, but no new Life Fellows will be elected.

SPECIAL EXHIBITION OF COLONIAL PRODUCTS AND INDUSTRIES.

A Special Exhibition of Collections illustrative of the Mineral Wealth and of certain Industries of the DOMINION OF CANADA, also of commercial products from QUEENSLAND, RHODESIA, WESTERN AUSTRALIA, and BRITISH NORTH BORNEO, is on view in the western half of the North Gallery, from 11 a.m. to 4 p.m., on week-days—Admission Free.

FELLOWS' DEPARTMENT.

The Reading, Writing, and News Rooms, are open for the use of Fellows every week-day from 10 a.m. till 11.30 p.m., and on Sundays from 3 p.m. to 10.30 p.m. The Library (on the First Floor), is open from 10 a.m. to dusk on Week-days, and from 3 p.m. to dusk on Sundays. The Map Room (First Floor) is open from 10 a.m. to 5 p.m. on Week-days.

The Poste Restante is open every week-day for receipt and delivery of letters and parcels. Letters addressed to initials only are not received, except in reply to notices in the JOURNAL, under "Requirements" Registry. The General Post Office Pillar Box is cleared daily twelve times, between 10.10 a.m. and midnight. Light refreshments only are provided in the Fellows' Rooms and at the bar of the Ceylon Kiosk.

EMIGRATION INFORMATION OFFICE.

The Office of the British Women's Emigration Association (*see page 330*), in the West Corridor, First Floor, is open daily from 10 a.m. to 4 p.m., and advice and information respecting emigration and openings in the Colonies may be obtained there free of charge. Enquiries of all kinds relating to the Colonies from intending Emigrants are dealt with in the Commercial Intelligence Department, and special information respecting Canada and the Cape Colony may also be obtained from the Curators for these Colonies, on application personally at their offices, or by letter.

"REQUIREMENTS" REGISTRY.

With the object of affording Fellows of the Imperial Institute, and the General Public resident in the United Kingdom, an opportunity of making known special "wants" or "needs" in the British Colonies, India, and Foreign Countries, space will be regularly devoted to *approved* notices in a column reserved for this purpose. Advertisers may have their replies addressed to them direct, *c/o the Imperial Institute, London, S.W.*, under a distinctive

number and initials. The cost of postage will be charged for the transmission of replies delivered at the Institute. Residents in the Colonies and India, and Foreign Countries, can register in like manner. (*For further particulars see page 324*).

SCIENTIFIC AND TECHNICAL DEPARTMENT.

The Scientific and Technical Department of the Institute has been established to acquire information by special enquiries and by experimental research, technical trials and commercial valuation regarding new or little known natural or manufactured products of the various Colonies and Dependencies of the British Empire and of foreign countries, and also regarding known products procurable from new sources, and local products of manufacture which it is desired to export. This work is carried out with a view to the creation of new openings in trade, or the promotion of industrial developments.

In the extensive and well-equipped series of Research Laboratories occupying the West Corridor of the Second Floor, a staff of skilled Chemists, under the direction of Professor Wyndham R. Dunstan, M.A., F.R.S., carry out the investigation of the chemical constitution and properties of new dye-stuffs, tanning materials, seeds and food-stuffs, oils, gums and resins, fibres, timbers, medicinal plants and products; animal products, minerals and ores, soils, cements, and various other products, with a view to their commercial utilization. Whenever necessary these materials are submitted to special scientific experts, by whom they are made the subjects of particular investigation or practical tests. Reports are also obtained from technical or trade-experts in regard to the probable commercial or industrial value of any such products, whilst full information is collected from official or other trustworthy sources regarding the probable extent and cost of available supplies. All materials requiring scientific or technical examination, or commercial valuation, should be submitted to the Institute for examination either by, or through the Foreign Office, the Colonial Office, the India Office, or the Board of Trade, or through the Colonial or Indian Government Authorities. Requests for the examination of such materials may also be submitted by Public Commercial Bodies and Institutions of the respective Colonies and Dependencies, or by the Representatives of H.M. Government in foreign countries.

COMMERCIAL COLLECTIONS.

The Galleries containing the Colonial and Indian Collections, and the Public Commercial and Industrial News Room, are open for free inspection by the public daily, *except Sundays, and any days specially notified*, from 11 a.m. until 4 p.m. Every information concerning the products, their supply, etc., can be obtained on application to the Curators of the Indian and Ceylon, Canadian, and South African Sections, to the general Curator, and to the Commercial Intelligence Department.

COMMERCIAL INTELLIGENCE DEPARTMENT.

The Office of this Department, in the West Corridor, First Floor, is open daily from 10 a.m. to 5 p.m. (on Saturdays till 1 p.m.), for the purpose of answering enquiries and supplying information relating to the Commerce (Export and Import) and Industries of India and the Colonies. Applications may be made personally or by letter. Special information may be obtained from the Curators in charge of the Indian and of certain Colonial Collections. Arrangements have been made for the translation for mercantile firms of Trade Circulars, Price-Lists, and Catalogues into any Foreign Language, including the conversion of weights, measures and coinages, etc., at cost price, and application for such may be addressed to this Department.

CITY BRANCH OF THE IMPERIAL INSTITUTE.

REMOVAL TO 49, EASTCHEAP, E.C.

The City Enquiry Office and Reading Room have been removed from 112, Cannon-street to larger premises at 49, EASTCHEAP, where a commodious apartment is also provided for the display, to merchants, manufacturers, etc., of raw and manufactured products received, from time to time, from the Colonies and from India, and for which it is desired to find openings in British markets. General commercial information is supplied to enquirers at all times.

A representative for INDIA attends on Monday, Wednesday, and Friday mornings.

A representative for the DOMINION OF CANADA attends daily by appointment.

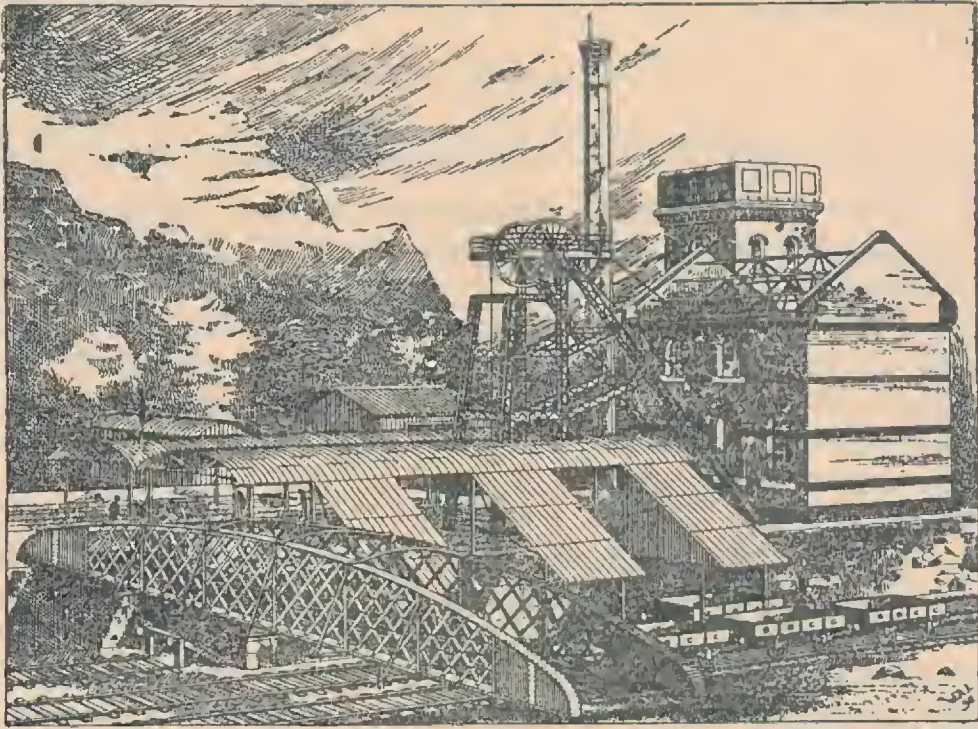
A representative for QUEENSLAND attends daily from 10 a.m. to 1 p.m.

The Commercial Agent for the NEW SOUTH WALES Government attends daily from 10 a.m. to 5 p.m.

Colonial and Indian newspapers, directories, reports, statistics, and other books of reference may be consulted by the general public. (*For further information see page 328*).

THE NORTHBROOK SOCIETY.

The Northbrook Society is affiliated to the Imperial Institute, and has a special room allotted for the exclusive use of its members in the Institute buildings. Its primary objects are to watch over and promote the interests of natives of India, and to provide a system of guardianship or supervision over such as are sent to Europe for education. The Society is controlled by a committee consisting of an equal number of Governors of the Imperial Institute and members of the Society, presided over by the Earl of Northbrook. It possesses an excellent library. Indian members, who pay no subscription to the Society, have the especial advantage of becoming Fellows of the Institute at half the usual subscription payable by the ordinary Fellows. Applications for membership of the Society should be addressed to the Secretary of the Northbrook Society, Imperial Institute, London, S.W.

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NOTICE.—For the early information and convenience of Shipowners, Captains, and others, ALL NEW ADMIRALTY CHARTS that may be published from time to time are noted every Monday in the *Shipping Gazette and Lloyd's List* on page 7; in the *Shipping Gazette and Lloyd's List Weekly Summary* every Friday, on page 1; and in the *Lloyd's Weekly Shipping Index* every Friday, on page 3 of Cover. The new and corrected Admiralty Charts are also noted in the following weekly and monthly journals:—*The Syren*, *The Nautical Magazine*, *The Geographical Journal*, *The Shipping World*, *The Mariner*, *THE IMPERIAL INSTITUTE JOURNAL*, and *The Steamship*, etc., etc.

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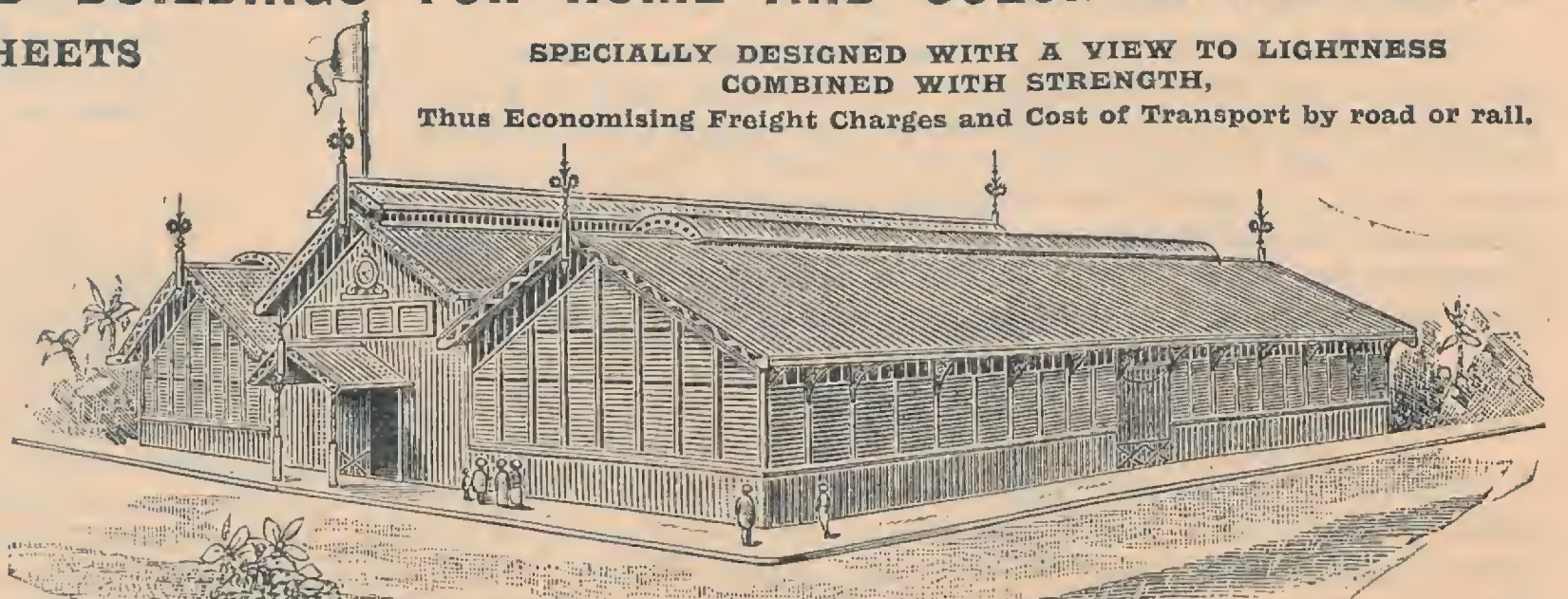
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AGRICULTURAL RETROSPECT.

UNITED KINGDOM.—November opened with a spell of dry weather which gave the opportunity for steady progress in the sowing of wheat and other winter crops. This only lasted till the middle of the month, however, when a few days of severe frost were followed by a heavy downfall of rain, sufficient nearly everywhere to suspend field cultivation. Stockfeeders may be satisfied with their position in view of the winter. The prolongation of the feeding season in the open economised their stores of roots and hay, which are abundant, so that even if the winter should prove a long and severe one they will not be short of supplies, whilst their forage crops for spring use have made an excellent start. In addition, there is the prospect of cheap maize, due to the great size of this year's crop in the United States; and low quotations for maize have the effect of cheapening feeding cakes.

A leaflet has been issued by the Board of Agriculture dealing with the disease of melons and cucumbers known as "leaf blotch," caused by the fungus *Cercospora melonis*. This is the most destructive parasite with which the cultivator of cucumbers, melons, pumpkins, etc., has to contend. In several cases growers report an annual loss of as much as £2,000, and in some instances the cultivation of cucurbitaceous plants has had to be abandoned. As to preventive measures, it is stated that if the foliage is fairly hard the disease cannot assume the dimensions of an epidemic, and even if it does appear it can be kept well in hand by spraying. To accomplish this end a fair supply of air should be admitted, so that the atmosphere is not constantly saturated with moisture. It is wise to spray in anticipation of the disease, using a solution of potassium sulphide—two ounces to three gallons of water, adding two ounces of soft soap. It is very important that the under-surface of the leaves be thoroughly wetted with the solution. If the disease is present the soil should also be drenched with the solution. Diseased leaves should be removed and burned before they decay and fall to the ground.

Many and varied improvements have been effected in connection with the dairying industry during the last quarter of a century, but little appears to have been done in the direction of improving the skill of the milker—that is, of the person who milks the cows. It is only lately that the idea has been grasped that a cow may be educated, as it were, into giving more milk, and that of better quality, if she is skilfully handled time after time by the milker. Properly-milked cows will keep up their flow of milk more readily than is the case with cows which are carelessly milked, and whose udders are not thoroughly drained of milk at each time of milking; the flow will, moreover, be maintained for a longer period. Careful milking, as thus understood, will steadily and permanently improve the individual cow as a milk producer. By properly manipulating the udder at the close of each milking the last traces of milk contained therein will be removed. Many cows yield the last part of their milk very slowly, and thin streams may usually be drawn for a considerable time after the full flow has ceased; by a few manipulations of the udder this residual milk may be brought down in a couple of minutes' time, and more milk will, as a rule, be obtained in this way than can be secured by the ordinary method of "stripping." Inasmuch as the milk thus obtained is very rich, being of the same character and composition as "strippings," the quantity of additional butter-fat is considerably greater than might be inferred from the volume of milk brought down. Originated in Denmark, this method of effectually completing the milking operation has been extensively tested at the Wisconsin agricultural experiment station. The investigations were made partly with cows in the station herd, and partly with cows in twelve different Wisconsin dairy herds. The aim in all cases was to ascertain the gain in the production of milk and of butter-fat obtained by a system of manipulations of the udder after the regular milking was finished. In the station herd the average daily production of milk from 24 cows was increased by 4.5 per cent. by means of the manipulation method, and the production of fat was increased by 9.2 per cent. as the result of a milking experiment continued for four weeks, the average gain in milk being 1 lb., and in fat 0.09 lb. per head per day. A similar average increase in production was obtained for the twelve dairy herds tested—a gain of 1.08 lb. in the daily production of milk per cow, and 0.1 lb. of fat. The results arrived at in this investigation of dairy herds, extending over a period of four months, with cows in all stages of lactation, indicate that this gain is maintained throughout the whole milking period. The results of the investigation, which was conducted by Professor F. W. Woll, show that a thorough system of milking is essential to successful dairying; for, apart from directly increasing the production of milk and fat from the cows, exhaustive milking is calculated to maintain a *maximum* flow of milk throughout the period of lactation, and to permanently develop the dairy qualities of both the dam and her offspring. The manipulations whereby the udder of the cow is completely emptied after

the full flow of milk has ceased are described and illustrated in the report, and they follow in the main the system devised by Dr. Hegelund in Denmark, where practical instruction is given in the method to milkers. As is well known, the British Dairy Farmers' Association gives prizes in milking contests at its annual London show, and it would be useful to encourage the adoption of the udder-manipulation system amongst the competitors. A practical knowledge of the anatomy of the udder should also be imparted to them, in the same way as the anatomy of the horse's foot is taught to shoeing smiths. County councils might aid this work.

COLONIES.—With the completion of the threshing operations in MANITOBA and the NORTH-WEST TERRITORIES, it is now ascertained that the estimate of the production of grain already published has been vastly exceeded. It is now officially stated that the total production of wheat has been 64,283,434 bushels, averaging 24.35 bushels per acre; of oats, 49,500,000 bushels; barley, 13,000,000 bushels. The whole crop has been saved in fine condition. Splendid weather has since been experienced, and autumn ploughing is far in advance of any past year. We have received from the Canadian Department of Agriculture a copy of a bulletin by Dr. Wm. Saunders, the Director of Experimental Farms, and Mr. F. T. Shutt, M.A., dealing with "Clover as a fertiliser." It sets forth the practical and convincing results which have been obtained at the Ottawa Experimental Farm in increased crops, by the ploughing under of green clover, which practice has been found to increase the crops for several successive seasons. The advantages of the operation are summarized as follows: (1) There is an enrichment of the soil by the addition of nitrogen obtained from the atmosphere; (2) There is an increase to the store of available mineral plant food (phosphoric acid, potash, and lime) in the surface soil, taken by the clover in part from depths not reached by the shallower root systems of other farm crops; (3) There is a large addition of humus, whereby the soil is made more retentive of moisture, warmer and better aerated, conditions favourable to vigorous crop growth. Humus also furnishes the material best adapted for the development of those forms of germ life that act so beneficially in the soil; (4) As an agent for deepening and mellowing soils, no crop gives such satisfactory results as clover; (5) Clover also serves a useful purpose as a catch crop during the autumn months, when the ground would be otherwise bare, retaining fertilising material brought down by the rain, and also that formed in the soil during the summer months, much of which would otherwise be lost through the leaching action of rains; (6) As shown conclusively by the particulars submitted, obtained by careful experiment over a number of years with the more important farm crops, the ploughing under of green clover has a most marked effect in increasing the soil's productiveness.

The *Jamaica Gazette* for November 4 contains the report of a speech before the Legislative Council by Mr. Sydney Olivier, Colonial Secretary and Acting-Governor of Jamaica, which gives a comprehensive survey of the present position of the colony. After pointing out that the general revenue for the six months ended September 30 was £404,415, or £32,792 more than the corresponding period last year—an improvement which really represents an increase of £50,000, or more than 14 per cent., in the half-year, owing to the inclusion in last year's account of certain items not forming part of the actual yearly revenue—Mr. Olivier referred to the very satisfactory increase in the exports of the staple products. In the first nine months of this year, compared with the similar period of 1901, there were large increases in the exports of bananas, oranges, cocoanuts, coffee, pimento, dyewoods, etc. The improved situation was principally due to the great increase of the exports of fruit to America. This was evidence that it paid the island Treasury, as well as the community as a whole, to make good roads for that traffic to the shipping ports and the railway stations. Mr. Olivier then made some observations as to the condition of Jamaica and prevalent delusions about it. He believed that a careful consideration of the extent and condition of planting throughout the island, of the seasons in recent years, and of the prospects of crops and markets, would show no reason for supposing that any check in the volume and value of the exports was approaching. On the contrary, further advance might be expected with confidence. If so, increased investment in planting might be looked for, to the general benefit of all classes. An influx of visitors might also be expected in future winters, and this, although it could not be regarded as in itself a very important contribution to the building-up of prosperity, since that must depend upon productive intelligence and activity, and not upon the patronage of holiday seekers, would no doubt give an acceptable stimulus to the demand for local produce and services, and might result in some permanent investment and extension of agricultural and industrial enterprise. There were, however, certain deterrents to the investment of capital in planting, and to the advent of visitors, which, absurd and incredible as they might seem, were yet of really powerful influence both in Great Britain and in the United States. Mr. Olivier

proceeded to describe reports which had been brought to his notice with regard to danger from disturbances of nature. It had been necessary to make an official announcement that Jamaica was 1,000 miles away from Martinique and St. Vincent, and quite free from any chance of being the scene of volcanic disasters. It had been stated that the eruptions would be followed by hurricanes; and what is 1,000 miles to a hurricane? A recent thunderstorm in Jamaica, such as occurs by the dozen in England every summer, took rank in Continental newspapers as a cataclysm of nature, and an earthquake which might have been noticed in England, but which he did not himself perceive, was reported as a possible precursor of a second Port Royal disaster. It was such exaggerations as these which were so great a disadvantage to the colony, and made investors fight shy of Jamaica land.

INDIA.—From the Second General Report on the cotton crop of India, issued by the Statistical Department, it appears that its condition on the whole is satisfactory. Except in Bombay, the acreage is above the average, and there the decrease is only a fraction over 3 per cent., while the condition is fair. In Berar, on a greatly expanded area, the crop is promising; in the United Provinces of Agra and Oudh its condition varies from 90 to 100 per cent. of a fair crop condition; in the Punjab about an average yield is expected; in the North-West Frontier Province the crop is a good one, and in the Central Provinces a record production is expected. The indigo crop in Madras last year was sown on an area 30 per cent. below the average for recent years. The reports of the areas sown during the current season show a further decrease of two-fifths on last year's figures, bringing the actual area down to about one-half the average. The falling off is, no doubt, largely due to low prices, but is more generally attributed to the untimely character of the rainfall during the early months of the monsoon. In South Arcot the growing of ground-nuts has again become more attractive than indigo.

FOREIGN COUNTRIES.—The wheat crop of the United States is estimated at 760,330,000 bushels, as against 752,000,000 bushels a year ago. This produce was grown upon 52,225,000 acres, so that the yield will average some 14.62 bushels to the acre. Looking back during the past ten years, we find that the two heaviest crops were in 1898 and 1891, when the average was 15½ bushels per acre; the lowest yield was in 1893, when the crop was barely 11½ bushels, while in no other year did it exceed 13¾ bushels. The yield of maize in the United States this year is estimated at 26.8 bushels per acre, and the number of acres under the crop at 94,870,000 acres; this makes the crop 2,542,516,000 bushels, which, if approximately estimated, is over a thousand million bushels greater than that of last year, which was only 1,522,519,000 bushels.

LABOUR RETROSPECT.

UNITED KINGDOM.—The closing month of the year brings little to lighten the industrial situation. It is satisfactory to see an effort being made in South Wales to arrange amicably a substitute for the sliding scale agreement which expires at the close of year. The fear of a stoppage at the end of the year is now at an end, as the owners have given no notice to terminate contracts, but have accepted a tentative agreement which will remain in force till the end of February. At the meeting of the Coal Conciliation Board for the federated mining districts in England and North Wales, the miners' delegates moved an increase in wages of 10 per cent., and the employers' representatives moved a reduction of 5 per cent. The matter was referred to Lord James of Hereford and a date chosen for a meeting. As regards shipbuilding, and trades dependent on it, it is evident that the lack of orders is affecting them badly. In London there are more members out of employment than for many years past, and great slackness also prevails in the West of Scotland, in Yorkshire, and on the Mersey. As a result, reductions in wages have been made of late, and further decreases are under discussion.

COLONIES.—Intending emigrants to SOUTH AFRICA have always been recommended in these columns to exercise caution before starting for a country where labour conditions are so varying. In the new colonies white labour is no longer at present in demand, excepting as regards skilled mechanics of the best class; and the same may be said of all the principal towns in South Africa. Inland, skilled men in the building trades will probably find employment. It should be borne in mind that the cost of living is very great. But as a set-off to this the margin of saving is also great, and a hard-working man should be able to put by a nest-egg more quickly than in the old country. It has been suggested that the Railway Department should import nine or ten thousand natives to work on the railways which are so badly wanted, and to construct which native labour is wholly inadequate. Numbers would remain, and the benefit accruing to the country at large would more than compensate for the increased cost per mile of the railways. Native wage labour on the mines has been raised,

the maximum average for all "boys" employed in mines now being fixed at 50s. a month, the increase being obtained by an extension of the piece- or task-work system. It would seem at first glance that an improvement in the recruiting of native labour might result from this move, but it is to be recalled that this maximum of 50s. is no more than the minimum of former times. The employment of white labour in connection with black at the mines has already produced friction, and was partly the cause of a strike at the Village Main Reef mine some time back. The mail has brought some details which throw an interesting light on the relations between white and black labour.

It seems that the manager of the mine, now that the machines are worked by the aid of white instead of Kaffir labour, suggested that the men should take charge of three machines instead of two, on the ground that the employment of white labour necessitated less supervision on the part of the man in charge. To this innovation the machine overseers objected, and up to the present it has been impossible to arrange for the men to resume work. All who have had any experience in the handling of Kaffirs know how inferior they are to whites for any class of work in which intelligence or skill is required, but in unskilled work no single instance has yet been shown where white labour has been able to compete with native, although of late quite a large number of experiments have been made in this direction. That a chargeman over two machines, when worked by Kaffirs, ought easily to be able to supervise the working of a third machine when he is supplied with white assistance does not admit of doubt, and it is to be regretted that the Miners' Association does not take a more intelligent view of the situation.

FOREIGN COUNTRIES.—In our last issue allusion was made, in connection with Mr. Moseley's Commission now at work in the UNITED STATES, to the American Civic Federation, founded on its present basis at the end of 1901. The aims and methods of this organization are worthy of further mention. Its leading principles are that at all times representatives of employers and workers, organized or unorganized, shall confer for the adjustment of differences and disputes before an acute stage is reached, that mutual agreements as to conditions of work shall be encouraged, and that when such agreements are made their terms shall be faithfully observed, both in letter and in spirit, by both parties. To carry out its purpose this department, which now has some 300 members, appoints an executive committee of 36, who include some of the most prominent men in the country, 12 representing employers, 12 employ  es, and 12 the general public. From this committee a committee of conciliation is appointed, containing three members from each group, whose duty it is, upon notice from the chairman of the executive committee of a threatened strike or lock-out of more than local magnitude, to use its good offices in restoring harmonious relations. The method relied upon primarily to secure the desired end consists of bringing representatives of the disputing parties together in conference, and getting them to talk over their differences before the temper of either side has been aroused. If, however, the two sides fail to reach an agreement, the Civic Federation is prepared to resort to arbitration, but only in case both parties desire their services. In such cases the disputants are invited to select two members from among the employers and two from among the wage-earners who sit on the executive committee, and these form a board of arbitration, power being reserved to the four, if it be necessary for a final decision, to add a fifth to their number from among the members of the executive committee who represent the general public. Men, however, who are not members of the executive committee may be chosen to serve as arbitrators, should circumstances render such a course desirable. In about two-thirds of the cases the result was either the prevention or ending of the strike.

The efforts, initiated by President Roosevelt, to arrive at an agreement on the points of dispute in the coal trade seem to be resulting favourably. It is stated that rough proposals, forming the basis of the negotiations, provide for a ten per cent. increase in wages, a nine hours' working day, and trade agreements between the miners and the companies employing them. These suggestions, however, appear to favour the men more than the employers may feel to be warranted.

The French coal-miners would not accept the decision of the Court of Arbitration, but the stoppage of the strike was brought about by the intervention of the Government, and by promises of legislation regarding pensions and the hours of work. The men gradually resumed, those at St. Etienne holding out the longest. After further negotiation an agreement was arrived at on most of the points at issue, both parties consenting to refer the question of bonuses to arbitration.

In GERMANY little has happened towards alleviating the depression under which the principal industries have been suffering for two and a-half years. The Commercial Treaties Association recently set their views on this matter

before the Imperial Chancellor. They consider that although the depression did not originate solely in the uncertainty with regard to commercial policy, that uncertainty has, nevertheless, contributed to intensify and prolong the crisis. A satisfactory state of things will not be restored until the element of stability and security has been introduced into the country's commercial relations with foreign countries. For, notwithstanding the considerable export trade which is still conducted under the protection of the existing treaties of commerce, German industry, in its most productive branches, is suffering from want of employment in a high degree, from widespread want of work for those whom it employs, and from reduction of wages. The spirit of enterprise is practically extinct, new plant is hardly anywhere being acquired, and manufacturing premises are hardly anywhere being extended. Moreover, the efforts of employers at least to keep their works going have resulted, especially in the case of syndicated industries, in the exportation of large portions of their productions at unprecedentedly low prices—a procedure which, if it were to last much longer, must inflict the gravest damage upon the German economic body, and entail consequences which would exercise a prejudicial influence for decades.

According to the *Times* the condition of the iron trade in RUSSIA is as critical as ever, if, indeed, it has not grown worse. A conference has been held of a hundred leading representatives of the industry to consider what measures could be taken to remedy this state of things. According to the *Novoe Vremya*, the most remarkable feature of the conference was the contrast between the views of the Ministerial representative and those of the manufacturers. The Ministry of Finance adheres to its view that the only cure for the existing depression is the development of the home market, which the great ironworks, preferring to live on Government orders, have hitherto almost entirely neglected. The manufacturers, on the other hand, persist in the view which they expressed at last year's conference, that the shortest way out of all their difficulties is the formation of a syndicate to regulate production and maintain prices. This they describe as a "radical measure for putting an end to the present crisis." The *Novoe Vremya* points out that such a syndicate has already been formed under the title "Society for the sale of the products of Russian metal works," and says that the industrialists are knocking at an open door. Their complaint appears to be that their syndicate is not powerful enough, as many firms have refused to join it. In particular, the Ural companies prefer to work independently, although they would be willing to join the syndicate if they had some security that the organization would not endeavour to keep up absurdly high prices in order to prevent the weaker and worse organized companies from going to the wall. The industrialists now seem to wish the Government to use its authority in order to smooth away these differences and to enable the syndicate to fulfil what in their opinion ought to be its proper purpose. The leading Russian organ protests against this, and says that the ironworkers seem completely to misunderstand the object for which the protective system has been established in Russia. Duties on foreign imports are not imposed for the benefit of a few large companies, but in order to secure a permanent supply of home-made products for the Russian markets, to the ultimate benefit of the Russian consumer.

H. M. Minister at Bucharest forwards an extract on the subject of the State protection granted in ROUMANIA to national industries. This extract states that this protection is of two kinds, viz., direct and indirect; direct by the imposition of taxes on importation, and indirect by the concession of advantages such as exemption from Customs' duties on raw materials, reduced railway rates for transportation, etc. There are three kinds of industries which benefit: (1) Timber cutting, petroleum boring, and such industries; (2) Industrial enterprises for which the raw material wholly or for the most part is produced by the soil of the country; (3) Manufactories which use raw materials wholly or for the most part imported from abroad. Only two of these classes of industry deserve protection; the other, namely, that which imports its raw material, has no chance of success in the country, and causes considerable loss to the State, owing to the fact that if it did not exist the products themselves would be imported from abroad, and the State would thereby benefit by the duty collected. In an article published in the *Revista Romana* on this subject, two typical instances are given, viz.: The manufactories of coarse cloth and cordage, which import all their raw material from abroad. By means of detailed statistics it is shown that these industries cause a loss to the State of nearly £1,480,000. The Journal adds that the idea is rapidly gaining favour that the State should cease its protection of those industries which are dependent on imported raw products, and that a distinction should be drawn between those industries which will thrive in Roumania and those which will not. In this way all State protection will be directed to those industries which have as basis agricultural and like products.

SCIENTIFIC AND TECHNICAL DEPARTMENT OF THE IMPERIAL INSTITUTE.

NATURAL PRODUCTS OF THE SEYCHELLES.

The annual report on the administration of this Crown Colony contains an interesting appendix by the Curator of the colonial Botanic Station, dealing with soil, climate, and natural resources of the islands.

The soil is composed principally of clay, varying from 9·7 to 25·1, and coarse sand 41·3 to 60·3 per cent. in the case of six samples recently examined by Mr. Boname, of the Station Agronomique de Mauritius. The nitrogen varied from '06 to '22 per cent., phosphoric acid from '03 to '21, potash from '01 to '05, lime 0 to '14, and magnesia 0 to '05 per cent. in the same samples. It will be observed that there is a considerable deficiency of potash, lime, and phosphoric acid, in these soils; the two latter constituents are, however, readily available in the islands in the form of immense deposits of guano, which are already drawn upon by neighbouring countries for the preparation of fertilizers; the deficiency of potash is stated to be due to the native habit of clearing ground for plantations by burning the weeds and rubbish on the selected area, so converting the potash of these plants into a soluble form which is washed away and lost so far as agricultural operations are concerned.

The climate of the country is well suited for planting operations, the average temperature being about 86°, and the rainfall 100 inches per annum. The chief difficulties in the way of the development of the colony are want of capital and the difficulty of obtaining labour; the native endeavours to become a proprietor on a small scale, and is loth to accept the position of a hired labourer, so that it is difficult to obtain sufficient help to work large plantations.

The principal foodstuffs cultivated are cassava, sweet potatoes, and bread fruit, which, together, constitute the staple food of the natives. Potatoes do not grow well except in the hilly districts, and even there they must be shaded from the sun by screens. Experiments have been made with the Jerusalem artichoke, the African potato (*Tuberosus colous*), yam bean (*Dolichos tuberosus*), ground nut, the sago palm and arrowroot, all of which could be successfully grown and their products exported if cleanliness and care were exercised in their preparation.

The Seychelles are particularly rich in spice-yielding plants, a species of the vanilla orchid (*Vanilla phalanopsis*), grows wild in the colony, and it is remarkable that the presence of this plant did not lead to the inauguration of vanilla planting earlier in its history. The plant cultivated is the true vanilla (*Vanilla planifolia*), which was introduced from Mauritius about 30 years ago. Experiments are now being carried out at the Station, with the object of finding a suitable manure for these plants, as it has been observed that the orchids yield pods of much finer quality when grown on well-manured Liberian coffee trees.

The cacao plant, which was formerly much cultivated, has been recently rather neglected in favour of the more profitable vanilla, and at present only about 18,000 lb. are annually exported to Europe, although there are indications that this will be increased in the near future. Much harm is done to the cacao pods by the rats which infest these islands, in spite of the fact that the Government encourages the destruction of these pests by offering a bounty to rat-catchers.

Pepper, nutmegs, cardamoms, and chillies, have been cultivated on a small scale, whilst cloves, which were introduced in 1771, and were formerly grown in immense quantities, are now never gathered on many estates, and the total export is usually only from 4,000 to 6,000 lb.

Although there are many localities in the islands suitable for the cultivation of coffee, but little of this article is produced, due principally to the primitive methods by which it is prepared for the market, and it is suggested that an improvement in the quality could be brought about by grafting other varieties, such as those of Java, on the Liberian coffees now in existence on the estates. Tobacco is grown to a small extent from a coarse-leaved Cuban plant recently introduced, but the product obtained is apt to contain too much nicotine. Other plants which it is suggested might be profitably introduced into the colony are cinchona, kola, cubebs, ipecacuanha, and camphor. The coca plant (*Erythroxylon coca*), has been grown on a small scale, and there are several indigenous species about which nothing appears to be known, and the constituents of which ought to be investigated. Cinnamon has long been acclimatised in the Seychelles, but is at present only utilized as supports for vanilla orchids.

Among oil-yielding plants the premier place is taken by the cocoa-nut palm, which, however, is here less productive than in most tropical countries; the produce is at present all used locally, although attempts are now being made to cultivate an export trade in copra, samples of this material having been recently submitted to the Scientific and Technical Department of the Imperial Institute for valuation. The castor-oil plant grows wild in the islands, and small quantities of the oil are occasionally prepared for local use. The palm-oil tree (*Elais guineensis*), grows well and the oil and kernels are exported on a small scale. Other oilseeds whose cultivation might be extended are the ground nut (*Arachis hypogea*), the candle nut (*Aleurites triloba*), which occurs throughout the islands, and a species of *Calophyllum*, which furnishes about 41 per cent. of oil.

The mangrove tree flourishes in the Seychelles, as it does along the whole east coast of Africa; its bark is employed, especially in Germany, as a tanning material, but has not found favour with English tanners owing to the red colour of mangrove-tanned leather. A species of divi-divi (*Cesalpinia pulcherrima*), has been experimentally grown at the Botanical Station, and a few plants are now available for distribution. *Indigofera tinctoria*, the indigo plant, is indigenous to the colony, but no attempt is made to produce the dye-stuff, and in view of the severe competition of artificial indigo with the natural product the inauguration of indigo planting can hardly be recommended.

The islands are rich, both in indigenous and introduced fibre-plants, such as sansevieria, fourcroya, originally imported from Mauritius, *Hibiscus tiliaceus*, dianella, and sterculia, whilst kapok, now being largely imported into Australia and Germany from Java, pandanus, from which sugar-bags are made and exported to Mauritius, and others not at present utilized, are widely distributed. The climate would also probably be suitable for the cultivation of ramie, Manilla and sisal hems.

Experiments are at present being made in the cultivation of rubber and gutta-percha trees, specimens of Ceara rubber (*Manihot glazovii*), and Assam rubber (*Ficus elastica*), having been introduced; both varieties have thriven well but only the latter has afforded a satisfactory yield of latex, and specimens of rubber prepared from this are now being examined in the laboratories of the Scientific and Technical Department. Preparations are now being made for the experimental introduction of *Castilloa elastica*, *Hevea Brasiliensis*, *Funtumia elastica*, which is common in Africa, and produces a rubber almost equal in value to Para rubber, and *Landolphas*; cuttings of these varieties will, in the near future, be placed at the disposal of planters.

Fruit trees of all kinds occur in the Seychelles, but so far little has been done towards creating an export trade except in oranges and bananas. Attention is specially directed in

the report to the advisability of cultivating the lime tree, *Citrus medica*, which is already widely distributed, and from which lime-juice, calcium citrate, and the volatile oil of limes could be profitably manufactured. Five varieties of pine-apple are indigenous, two of which at least are suitable for table use; the Maingard, under cultivation, occasionally produces here fruits weighing from 15 to 20 lb., which could be placed on the European market from November to January, during which season the supplies from other countries are not available.

The sugar-cane is also cultivated, and from the juice a kind of cider is prepared, but the production of spirit has now almost ceased, owing to the competition of Mauritius rum, which is imported to the extent of over 15,000 gallons annually.

An essential oil industry might also be created in the colony, since the various citrus species, ylang-ylang, vetivert, patchouli, pelargonium, and sandal wood, all yielding essential oils used in medicine and perfumery, are indigenous to the islands.

THE WITWATERSRAND MAIN REEF SERIES.

In a paper read before the Institution of Mining and Metallurgy, Messrs. T. A. Leggett and F. H. Hatch discussed the gold production and life of the Main Reef series down to a depth of 6,000 feet. One of the earliest estimates was that made by Messrs. Hatch and Chalmers in 1895, who forecasted a production from Witwatersrand generally within half a century of £700,000,000 sterling. For this estimate an average milling width of 3 feet was assumed for the whole Rand; the yield was averaged at 38s. per ton, and it was assumed that the reef would be worked down to a vertical depth of 3,500 feet.

More recently Mr. J. Hays Hammond estimated a total production from the central section of the Rand of £600,000,000, and from the east and west sections £200,000,000, and puts the future duration of profitable operations on a large scale at less than twenty-five years. In contrast to this Mr. W. Bleloch estimates the gold available for practical mining in the area between Randfontein on the west, and Halfontein on the east, at 2,871 millions sterling. In this estimate the vertical depth to which mining will be carried is put at 7,000 feet for the richer central section of the Rand; at 3,000 feet for the Vogelstrius to Paarl Central Section, and at 6,000 feet for the remainder. The present writers have collated the facts on which such estimates can be based, and have thence deduced as fair a one as is possible under the circumstances. The geological character of the Witwatersrand conglomerates is now pretty well understood. The sheets of "banket" outcropping along the Rand have been proved to be gold-bearing for a distance along the strike of 47 miles. The continuity in depth has been proved by boreholes, e.g., in the:—

Violet borehole (dip of the Randfontein Series) to a depth of	1,884 feet.
New Rand Mines (dip of the Aurora West) to a depth of	2,040 „
Geduld (dip of the Modderfontein Series) to a depth of	2,136 „
Rand Victoria (dip of the Simmer and Jack) to a depth of	2,391 „
Beguidenville (dip of the City and Suburban) to a depth of	3,130 „
Angelo Deep (dip of the Angelo) to a depth of	3,783 „
Turffontein (dip of the Village Main Reef) to a depth of	4,887 „

The one point on which there is little evidence is the gold contents of the conglomerate beds at depths of 4,000 feet to 5,000 feet. The borehole assays have proved that they do carry gold in variable quantity, but it is not possible to make any deductions from half-a-dozen samples from boreholes miles apart, especially as the gold occurs in pockets or similar segregations of the precious metal. The even grade is only maintained by keeping the development well ahead of the mill and drawing the ore from a number of stopes of different value. Therefore the average value for any section of the reef can only be determined by practical trials over long periods. The following estimate is based on the assumption that the Main Reef Series will be worked to a vertical depth of 6,000 feet. Mining properties are to-day being sold where the reef lies at a depth of 8,000 feet and over, and companies are in course of formation with the object of developing these areas. It is, however, impossible at present to fix a limit to the depth to which mining operations may ultimately be carried, because of the many indeterminate factors entering into the problem. The depth at which it has been proved possible, under ordinary conditions, is 6,000 feet, and forms the basis of most mining calculations. In estimating the value of the reefs of the Rand the area was divided into sections, and the following factors determined in each case:—

- (a) Average length in feet of reef along the strike.
- (b) Average "backs" (or length along the dip) in feet, down to a vertical depth of 6,000 feet.
- (c) Average milling width in feet.
- (d) Average percentage deduction for unpayable ground, dykes, safety pillars, etc.
- (e) Average yield, per ton, in pounds sterling.

The estimated total production of gold in pounds sterling for any section, then, is—

$$\left\{ \frac{a \times b \times c}{12} - d \right\} \times e$$

where one ton is represented by 12 cubic feet. Factor *a* was obtained by direct measurement; *b* by measurement on geological transverse sections. The milling width *c* was the width of reef actually sent to the mill, obtained by deducting from the known stopping width a percentage equivalent to that of the waste rock sorted out. Factor *d* is an arbitrary amount varying with the character of each section. In the richer mines a deduction of 5 to 10 per cent. was made, while in the lower grade mines as much as 30 to 50 per cent. of the total reef tonnage was rejected. Factor *e* is the average yield of the mines comprised in each section for the five years ending October, 1899. The sections are the following:—

- No. 1. Radfontein "A" Block inclusive, to Luipaardsvlei (West Boundary).
- „ 2. Luipaardsvlei (West Boundary) to Grey's Mijnpacht, inclusive.
- „ 3. West Roodepoort to Durban Roodepoort, inclusive.
- „ 4. Kimberley Roodepoort to Bantjes, inclusive.
- „ 5. Aurora West to Paarl Central, inclusive.
- „ 6. Langlaagte Royal to Crown Reef, inclusive.
- „ 7. Johannesburg Pioneer to City and Suburban, inclusive.
- „ 8. Meyer and Charlton to George Goch, inclusive.
- „ 9. Henry Nourse to Jumpers, inclusive.
- „ 10. Treasury to Glencairn, inclusive.
- „ 11. Knights to Balmoral, inclusive.
- „ 12. Ginsberg to Blue Sky, inclusive.
- „ 13. Chimes West to Modderfontein Extension, inclusive,

The average yields from 1894 to 1899, from which factor *e* was obtained, are shown in the first half of the following table, and alongside is given the estimated production:—

AVERAGE YIELDS 1894-1899.					ESTIMATED TOTAL PRODUCTION.			
Section.	Total tons milled.	Total value.	Value per ton milled.	No. of mines.	Length along reef in miles.	Estimated total production.	Amount already produced to Dec. 31, 1901.	Estimated future production.
No.		£	s.			£	£	£
1	727,107	1,343,310	36'05	4	5'464	124,376,000	1,627,637	122,748,363
2	973,140	1,733,655	35'62	9	4'924	115,847,000	2,192,840	113,654,160
3	1,422,840	3,049,769	42'87	6	2'273	33,059,000	4,347,032	28,711,968
4	178,440	221,370	24'81	2	3'324	18,197,000	285,170	17,911,290
5	1,465,358	2,103,989	28'72	8	5'398	97,606,000	3,410,320	94,195,680
6	3,030,500	5,770,070	38'13	5	1'553	99,765,000	9,125,945	90,369,055
7	4,405,416	12,237,864	65'56	12	2'600	231,546,000	20,416,707	211,129,293
8	1,752,838	2,827,816	32'27	4	1'756	52,713,000	4,061,352	48,651,648
9	1,994,712	4,581,111	45'93	5	2'197	94,705,000	5,934,616	88,770,384
10	6,808,877	12,159,848	35'72	11	3'750	213,423,000	16,606,250	196,816,750
11	624,581	862,451	27'62	2	1'572	24,180,000	999,794	23,180,206
12	1,059,888	2,334,042	44'04	4	4'015	107,112,000	2,462,667	104,649,333
13	1,378,164	2,095,770	30'41	5	8'049	97,794,000	2,767,645	95,026,355
Totals	25,821,861	51,328,065	39'76	77	46'875			1,236,084,485
					Banks, Customs	works, etc.	2,523,776	2,523,776
						1,310,323,000	76,762,291	1,233,560,709

For the three years preceding the war the average increase of production was at the rate of £4,000,000 per annum, the production for 1899 being about £19,000,000. Allowing 18 months from January, 1902, for the industry to be restored to the conditions existing in August, 1899, a similar increase of production would bring the output to at least £30,000,000 by June 30, 1906, and if this rate of production were maintained from that time onwards, the total production of £1,233,560,709 would give a life from January, 1902, of 42½ years. As, however, the production will decline gradually, the life of the industry is likely to be prolonged a considerable number of years beyond the time indicated.

THE IRON RANGES OF NORTH-WESTERN ONTARIO.

Although the iron ranges of the upper part of the Lower Huronian are far more extensively developed in Ontario than other varieties of iron-bearing rocks, yet examples of other kinds of iron ore deposits are found in the province. Those of the Lower Huronian, which are the oldest as well as the most important, may be divided into three well-marked types: that of the iron range proper, which is apparently the uppermost group; lenses of magnetite interbedded with green schist, as at the Atikokan river; and titaniferous magnetites associated with basic eruptives. Parallel with these ancient western iron ore deposits should perhaps be placed the magnetites of Eastern Ontario, which are associated with what are usually called Upper Laurentian rocks, probably the equivalents of the western and northern Huronian. Ascending to the Animikie, which is perhaps Lower Cambrian, we find the largest and most easily worked iron mines in the world in the Mesabi range in Minnesota, but no workable deposits have yet been discovered of this age in Ontario. Belonging to the Pleistocene age are the bog ores of Charlotteville town and the magnetic iron sands widely found near Peninsula, north of Lake Superior.

The most widely spread of the iron-bearing rocks of Ontario, as well as of the adjoining States, are the siliceous ones, commonly of jasper or chert or white or grey granular silica finely interbanded with magnetite or hæmatite, the whole being usually more or less crumpled, or brecciate, and standing nearly vertical. The unchanged iron range rock seldom carries iron enough to be an ore, and contains usually below 35 per cent. On the other hand the secondary ore bodies, chiefly hæmatite or limonite, formed in troughs of the underlying schists or eruptives, are often of excellent quality.

At present the Helen mine at Michipicoton is the only one working a deposit of this sort. The siliceous iron range rocks occur in practically every Lower Huronian area in Ontario, and have been traced, excepting a few important breaks, right across the northern half of the province. An examination of these was made during last summer by Professor Coleman.

Port Arthur.—Banded jaspery ores of low grade have been long known to exist along Mattawin River and on Hunters Island, the latter including the N.W. extension of the famous vermilion iron range of Minnesota. The nearest exposures to Port Arthur are in the neighbourhood of Kaministiquia station C.P.R. One occurs about a mile south of the station, and here red jasper is interbanded with hæmatite and magnetite. The strike is about east and west and the dip almost vertical. The other outcrops are on the west side of Kaministiquia river. South of Coumeé township, iron deposits containing bands of magnetite one or two feet wide have been traced for a distance of eight miles.

To the north of *Atikokan River* a little above Sabawe Lake, the range is disclosed as a steep narrow hill of green schist interbedded with lenses of magnetite. A tunnel 288 feet long has been driven into the ridge a little above its base and shows the following section—rock, pyrrhotite and ore 70 feet, ore 44 feet, rock 62 feet, ore 10 feet, rock 21 feet, ore 16 feet, rock 65 feet, total 288 feet. These large lenses of magnetite stand nearly vertical and run in a direction almost east to west. Several diamond drill holes have also been made at different angles which prove that these deposits extend for a considerable distance and maintain their dimensions. The rocks probably belong to the Keewatin or Lower Huronian system. Gold also has been found in this district.

On the south side of Nickel Lake in *Watten* township, the iron range consists principally of granular silica interbanded occasionally with magnetite, but more often heavily charged with sulphides, especially pyrrhotite. In places the sulphides become massive, hardly anything else being present, and one band of pyrites 15 feet thick just at the shore of Lake Nickel may, in future, be of importance as a source of sulphur. North of the lake there are two ridges containing much banded quartz and magnetite; none, however, of the iron range deposits examined in this district can be called marketable ore, but there are indications that secondary ore deposits may exist, and a lens-shaped deposit of magnetite 24 feet wide and 270 feet long has been found near the junction of a ridge of granite with a mass of green schist, in the neighbourhood of Watten township.

Banded iron ores have long been known to exist on the *Slate Islands*, which lie at a distance of eight miles from the shore in Lake Superior. As the shipping facilities are unsurpassed, the discovery of workable deposits would be of great importance. The group consists of one large island, a smaller one and a number of islets. The islands to the north consist chiefly of volcanic and schistose rocks; banded jasper and conglomerates occur, but no deposits of iron were found.

At the *Helen Mine* (IMP. INST. JOURN., Vol. VII., p. 125) several drill holes have been put down, and analyses made of the cores at different depths. Drill hole No. 1, located near the point, was sunk vertically 188 feet, all in ore, containing on the average 63'89 p.c. of iron

0.034 p.c. of sulphur, 0.016 p.c. of phosphorus and 2.24 of insoluble matter. Drill hole No. 3, located 440 feet from this, was put down vertically for 72 feet, 18 feet being soil. The ore contained 54.73 p.c. of iron, 0.015 p.c. of sulphur, 0.017 p.c. of phosphorus, and 8.40 p.c. of insoluble matter.

TASMANIAN TIMBERS.

The forest areas of Tasmania are still of considerable extent, owing to the fact that the island has not yet attracted a population so dense as that of the neighbouring continent, so that fewer clearings for farming operation have been made, and less attention has been paid to the exploitation of the forests for timber. In a paper recently contributed to the Royal Society of Tasmania, and now printed in pamphlet form, Mr. A. O. Green gives the results of a series of determinations of the mechanical properties of the principal timbers of the island, supplemented by notes on their working qualities, and on the botany of the trees producing them, from which a summary may well be given in this JOURNAL, as a continuation of similar articles on Colonial timbers which have been from time to time published in these columns. The Tasmanian forests present the usual features of the forest areas of these latitudes, viz., an underlying growth of ferns, succeeded by tree ferns and scrub trees overtopped by the principal timber trees belonging to the eucalyptus and myrtle class. The chief eucalyptus trees are :—

	Products obtained.		
<i>Eucalyptus globulus</i>	Blue gum	.	Timber and essential oil
<i>Eucalyptus stuartiana</i>	Red gum	.	Timber
<i>Eucalyptus Mülleri</i>	Müller's gum	.	Timber
<i>Eucalyptus obliqua</i>	Stringy bark	.	Timber, tanning-bark and kino
<i>Eucalyptus amygdalina</i>	Peppermint	.	Timber and essential oil
<i>Eucalyptus hæmastoma</i>	Gum-topped stringy bark	.	Timber
<i>Eucalyptus regnans</i>	Swamp gum	.	Timber
<i>Eucalyptus viminalis</i>	White or manna gum	.	Timber and eucalyptus honey
<i>Eucalyptus sieberiana</i>	Iron bark	.	Timber
<i>Eucalyptus gunnii</i>	Cider gum	.	Timber and fermentible sap
<i>Eucalyptus coriacea</i>	Weeping gum	.	Timber

The chief acacias are :—
Acacia melanoxylon. Blackwood. This tree is widely distributed in clumps and grows to a height of eighty feet, with a diameter of two to four feet. The timber is brown or red in colour, resembling walnut and pencil cedar ; it is used for cabinet-making and carriage building.

Acacia dealbata. Silver wattle. The timber of this tree is occasionally used for furniture making, but the bark is its most important product and is employed for tanning, as is also the case with the black wattle (*Acacia decurrens*).

The so-called Myrtle (*Fagus cunninghamii*) closely resembles the European beech in the character of its timber, but, owing to the occurrence of the tree in at present inaccessible districts, it is not much used.

Pine trees are of less importance in Australasia than in other countries, their place being taken by eucalyptus. Five members of this class are known in Tasmania, viz., Huon pine (*Dacrydium franklinii*), King William pine (*Athrotaxis selaginoides*), also known locally as pencil cedar ; Celery top pine (*Phyllocladus rhomboidalis*), Oyster Bay pine (*Frenela rhomboidea*), which produces a useful timber, and in addition a fragrant resin, said to resemble sandarac and to be suitable for varnish making, and sassafras (*Atherosperma moschata*), which yields a soft light timber suitable for carving, whilst from the bark and leaves an extract employed locally as a tonic is prepared.

Among the smaller "scrub" trees are :—
Melaleucia ericafolia ("tea" tree). The leaves of this tree contain, like the allied species *M. minor*, an essential oil which has not yet been chemically examined.

Casuarina species. The timbers of these small trees are, owing to their rich and varied colourings, especially prized for cabinet-making and veneer-cutting,

The mechanical properties of the commonly-occurring timbers, together with their European and American analogues, are given in the following table :—

	Mean weight per cubic foot.	Transverse strength.	Crushing stress along the grain.	Crushing stress across the grain.
	lb.	$\frac{L}{W}$ 4 bd °		
Ash (English)	47	2,130	9,000	—
Beech (English)	43	1,794	8,500	—
Yellow deal.	36	1,600	6,000	626
Oak (English)	54	1,788	8,300	2,316
Blue gum (dry)	60	2,706	9,000	4,500
Stringy bark (dry)	57	3,273	8,000	4,500
Gum-top stringy bark (dry)	50	1,958	—	—
Swamp gum (dry)	54	2,367	—	—
Peppermint (dry)	59	1,623	—	—
White gum (dry)	46	1,717	—	—
Myrtle (dry)	47	2,804	7,000	4,500
Leatherwood (dry)	45	3,258	8,000	6,000
Celery-top pine (dry)	42	2,225	7,000	1,000

THE CULTIVATION OF CASTILLOA ELASTICA IN JAVA.

In the previous number of this JOURNAL (Vol. VIII., p. 292) an account was given of some experiments carried out in Central America by Dr. C. O. Weber on the latex and rubber of *Castilloa elastica*, and the information contained therein may be supplemented by a brief description of other experiments on the same subject which have been made by Dr. Spire in the Dutch East Indies. (*The India Rubber World*, N.Y., Vol. 27, p. 43).

It will be remembered that Koschny, after a detailed study of the *Castilloas* in Central America, came to the conclusion that there are three varieties of *C. elastica*, differing considerably in rubber-yielding power, and he thought that it must have been the worst of these, *C. elastica*, var. *rubra*, which had been planted in the East Indies and given such discouraging results in some cases. Dr. Spire, however, after a careful study of Koschny's monograph on the subject, was not able to determine the identity of the particular variety which was introduced into Java. All the *Castilloas* there have resulted from two seedlings which were planted in 1883, and from the seeds yielded by these a very large number of trees have been obtained, some of which have now attained a height of 65 feet and a circumference of over 50 inches.

The experiments on the yield of latex and rubber were carried out by Dr. Spire in May, 1901. The tappings were made by a series of V-shaped cuts, extending from 10 to 15 feet up the trunk and connected at their bases by a single vertical incision. The latex, which

flowed freely, was at times very white and at others had a brownish tinge, while some incisions only yielded a blackish fluid which exuded very slowly. The latex obtained by Dr. Weber at Las Cascadas was in the form of a thick cream, which did not flow readily, and in this case a continuous spiral incision round the trunk was found preferable to the method of tapping described above.

The rubber was separated by diluting the latex with water and allowing it to stand, when the rubber globules slowly rise to the surface, leaving a clear serum which is drawn off from time to time. The rubber globules finally cohere to form a cake, which is removed at the end of the eighth day and the liquid remaining in it is extracted by pressure.

The weight of the rubber obtained from six trees which were each tapped twice was as follows :—

	First tapping.	Second tapping.	Total.
	grams.	grams.	grams.
First pair of trees	28	130	158
Second „	220	290	510
Third „	125	205	330
Total	373	625	998

The two trees which gave the largest yield were planted in 1884 and were therefore about 7 years old at the time. The result in dry rubber was 340 grams for the first tapping and 600 grams for the second, or a total of 940 grams, from the six trees, being an average yield of about 5.5 oz. The average yield of rubber from a tree 8 years old is given as 6.25 oz. This is a much lower yield than was obtained by Dr. Weber from trees of the same age (viz, 14.2 oz.), but is better than the result of Dr. Trimen's experiments in Ceylon, which gave a maximum yield of only 4.3 oz. This difference may be due, as Koschny thinks, to the East Indian *Castilloa* being an inferior variety, or, if not, it must be caused by differences of climate and soil.

In general practice the tapping and collection of the rubber is done by Malays, who are carefully supervised to prevent the destruction of the trees, and the men are required to deliver about 1 lb. of rubber daily. When brought to the factory the rubber is cleaned by washing in running water and is then dried by exposure to the air in the shade. The cost of collection, purification and packing amounts to about 3 florins per picul (132 lb.) and the price obtained for the rubber in 1900 was 300 florins per picul, so that even with the low yield the industry is a profitable one.

The *Castilloa elastica* of Java will not thrive in moist and swampy land, but is suited by a high and dry situation, through the altitude must not be too great, as experiments made at a height of 3,500 feet were unsuccessful.

Castilloa elastica is also being cultivated in Sumatra, where it yields an abundant latex, which, however, appears to contain a large percentage of resin.

THE UTILIZATION OF ATMOSPHERIC NITROGEN.

The question of the world's supply of fixed nitrogen, and its bearing on the possibility of raising sufficient wheat to satisfy the future requirements of the bread-eating peoples, were brought into prominence by the presidential address of Sir William Crookes, at the British Association in 1898, and have continued to excite considerable interest. At the present time Chili saltpetre is the chief source of available nitrogen, but it is stated that at the present rate of consumption there is not more than 30 years' supply of this available, so that it is evident that some fresh source must be looked for in order to meet future needs. It is well known that nitrogen can be made to combine directly with oxygen by means of an electric arc, with the formation of oxides of nitrogen, which can be afterwards converted into nitric acid of nitrates, which can be afterwards converted into nitric acid or nitrates, and Lord Rayleigh has shown that with cheap power available nitrates could be made by such a process at less than the present cost. It was announced some time ago that the manufacture of nitric acid and nitrates from atmospheric nitrogen by such a method was to be commenced at Niagara, and recently some particulars of the apparatus which is to be employed have appeared in the technical papers (*The Electrical Review*, Vol. 51, p. 721).

For carrying out the process on a large scale it has been found necessary, in order to secure efficiency, to employ a large number of small arcs so as to present a very large surface for a small expenditure of power, and for this purpose a special apparatus has been designed. It consists of a cylindrical metal box, five feet in height and four feet in diameter, having on its inner surface six vertical rows of fixed contacts, 138 in all, each of which terminates in a platinum wire. Inside this is another cylinder, capable of revolution round a vertical axis, and furnished with similar contacts on its outer surface, the two series of platinum points being 1/25th of an inch apart when opposite. The contacts of the outer cylinder are connected to the positive pole, and those of the inner to the negative pole of a dynamo generating direct current at 8,000 or 10,000 volts, so that as the inner cylinder revolves the negative contacts approach the positive and arcs are formed, which are then drawn out, and finally extinguished as the distance between the points increases. The inner cylinder makes 500 revolutions per minute, so that each contact is made and broken fifty times per second, giving a total of 6,900 arcs per second. Each arc receives about .005 ampere, and lasts for about one 20,000th of a second. When the arcs form there is a sudden increase in the current, and short-circuiting is prevented by inductance coils in series with the arcs. These retard the current for about one 40,000th of a second, and during the remainder of the period as the arc is drawn out and about to break their effect is to prolong it. When current at 8,000 volts is used with an average of .005 ampere per arc, the arcs are drawn out to four or six inches in length.

Air, or preferably a mixture of oxygen and nitrogen in equal parts, is circulated through the apparatus, being renewed at the rate of three or four cubic feet per minute, and on leaving it contains about 2.5 per cent. of oxides of nitrogen. If nitric acid is required, the latter are absorbed by passage through a scrubber tower filled with coke down which water is allowed to percolate, and for the production of alkaline nitrates the water is replaced by a solution of caustic alkali.

The theoretical yield is 1 lb. of nitric acid per 7 H.P.-hours, and though the practical efficiency of the apparatus is not given, it is stated that the results obtained at the experimental station have been very satisfactory. The works at Niagara are nearly completed, and operations will be commenced at an early date with 2,000 H.P., so that it will soon be possible to estimate the commercial value of the new process.

THE CULTIVATION OF FIBRE PLANTS IN MAURITIUS.

The only fibre plant which has been hitherto grown in Mauritius on the large scale is *Furcraea gigantea*, commonly called "aloes vert," but of late years its cultivation has been neglected, although the fibre is still prepared and exported. Of other fibre plants, *Agave americana* occurs in Mauritius in the wild state, but less abundantly than *Furcraea*, whilst several years ago *Agave rigida* v. *sisalana* was introduced.

When *Furcraea gigantea* grows under favourable conditions such as occur in Mauritius, it undergoes rapid multiplication by means of the numerous small plants produced on the flower stalk which fall to the ground and take root. Owing, however, to the mutual proximity of the plants thus produced, the yield and quality of the fibre is not such as could be obtained from a plantation in which the plants were placed at a convenient distance from

one another and could develop normally. In view of the high prices now obtainable for textile fibres, attention has been drawn to the desirability of creating new plantations and of submitting the fibres to systematic cultivation and exploitation. It thus becomes of importance to consider which plant would yield the best results. The contradictory opinions of fibre manufacturers with regard to the relative values of *Furcraea* and *Agave sisalana*, have led to a comparative investigation of the production of fibre by these two plants, an account of which is published in the Annual Report for 1901 of the *Station Agronomique* of Mauritius. The results show that the sisal would be the more profitable plant to cultivate.

The quantity of *Furcraea* fibre exported from Mauritius has varied considerably in recent years; 3,100 tons were exported in 1900 at an average price of 302 rupees per ton, whilst in 1901 only 1,243 tons were exported at an average price of 321 rupees per ton. The prices obtained for this fibre are far below those obtained for sisal in countries such as Mexico and the Bahamas, where the *Agave* receives a regular cultivation. The quantity of fibre obtainable from Sisal amounts to about $3\frac{1}{2}$ per cent. of the weight of the leaves, whereas *Furcraea* yields only about $2\frac{1}{2}$ per cent. Although the *Furcraea* fibre is finer and more supple than that of Sisal, yet for this very reason it is easier to prepare white and clean products from the latter plant than from the former. The vegetation of the two plants presents but little difference, and it may be presumed that they would yield practically the same number and weight of leaves per arpent. It is estimated that one arpent of land would yield annually from 630 to 1,050 kilos. of Sisal fibre or from 450 to 750 kilos. of that of *Furcraea*. Both plants are well adapted for the utilisation of dry, stony ground, unsuitable for the cultivation of the sugar-cane, but their composition shows that they abstract a considerable quantity of mineral substances from the soil; since they yield good products on dry and arid ground, it is evident that they possess a great power of assimilation and can utilize the soil to greater advantage than other and more exacting plants. In this industry, however, only the insignificant quantity of mineral substance which is contained in the fibre is exported, whilst nearly the whole of the matter removed from the soil remains as residues which could be utilized as manure. Analyses have been made of the ash of the leaves of both *Furcraea* and Sisal, which show that from a practical point of view their composition may be considered to be identical. From the composition of the green leaves of these fibre plants, it is seen that they require, on an average, the same amount of phosphoric acid, but more potassium and a much larger quantity of calcium than an ordinary crop of sugar-cane.

THE EXTRACTION OF ESSENTIAL OILS IN THE WEST INDIES.

The production of essential oils has hitherto been one of the minor industries of the West Indies, and is one which is capable of greater development. Dominica, whose share in the trade is greater than any of the other islands, has exported in the last ten years essential oils amounting in value to £48,022. The various oils which have been prepared, and the methods of extraction adopted in Dominica, are described in the *West Indian Bulletin*, Vol. III., No. 2, in a paper by Mr. J. H. Hart, Superintendent of the Botanic Gardens, Trinidad.

The "distillation" method consists in distilling the material with water in an ordinary still, having an arrangement to keep the contents constantly stirred. The "expression" method consists in forcing out the oil from the leaves by powerful pressure. Oils are obtained from citrus fruits by means of a machine called an *écuelle*, which ruptures the oil sacs in the peel, causing the oil to run out.

The following oils have been prepared from material grown on the lands of the Botanic Department, Trinidad, viz:—Citronella, lemon-grass, seville orange, sweet orange, lime, lemon, mandarin orange, clove, pimento, bay, lemon-bay, eucalyptus, mace, nutmeg, and camphor.

Citronella is new to the West Indies, and is more valuable than lemon-grass, being used largely as a perfume for soap.

Oil of Mandarin orange has not hitherto been used to any extent, as it has been difficult to obtain except in small quantities, but it grows readily in Trinidad.

Lemon-bay oil is obtained from the leaves of a variety of *Pimenta acris*, which is strongly lemon-scented; the oil contains citral.

Good samples of oils have been prepared from refuse mace and wormy nutmegs which were unsaleable.

In view of the Japanese Government's monopoly of the camphor trade of Formosa, there appears to be an opening for a very profitable trade in this substance. The camphor tree will grow readily in the West Indies, some which were planted three years ago at the Trinidad Experiment Station being now ten feet high. More camphor occurs in the wood of the tree than in the leaves or young branches, and is obtained from the wood by distillation, oil of camphor then being extracted from the solid by pressure.

Probably the most promising oil is that obtained from the bergamot fruit, the best oil being yielded by graftings of selected kinds. The material for producing the oil should be carefully sorted, and variations in the quality result in an inferior oil.

The Hon. W. Fawcett suggests the cultivation of *Cananga odorata*, from which the perfume ylang-ylang is obtained. It is a valuable oil, and the plant grows with great facility in Jamaica.

GENERAL NOTES.

THE BANANA INDUSTRY IN JAMAICA.

Banana cultivation seems to be one of the most promising industries of Jamaica, and an account of it, written by the Hon. W. Fawcett, appears in the *West Indian Bulletin*, Vol. III., No. 2. There were over 29,000 acres of banana trees under cultivation in Jamaica at the end of the year 1901, during the last nine months of which nearly nine million bunches were exported from the island, being about double the amount exported in 1897. Statistics compiled from the accounts of several large estates show that the industry is a very profitable one, the receipts being, as a rule, about twice the expenditure.

There are several varieties of bananas known, but the only one exported from Jamaica to any extent is that known as the Martinique or Pouyat variety, this being the best for the purpose, though the "Guindy" from Madras is also good. Some red bananas are exported to America, but are only used as a decorative fruit for the table, and the high price obtained for them is maintained by exporting them in small quantities.

The soil of Jamaica is admirably adapted for the cultivation of the plant, the roots of which require a deep loam, well drained but retentive of moisture. If the ground is either too dry or too wet, the roots decay. If the tree is exposed to strong winds, the leaves are soon torn to shreds; from this fact and the nature of the soil required, it is seen that the banana was originally developed in forest-land where it was protected from wind, and so the best situation for a banana plantation is a cleared forest with shelter belts of trees left standing.

In planting, the trees are spaced, as a rule, to allow them about 15 feet square, but the space required varies with the locality. In harvesting the fruit, considerable care is necessary with that intended for export, in order to prevent bruising. The bunches, which weigh from 80 to 100 lb. each, are cut down by one man, while another catches them as they fall; they are then wrapped in "trash" and removed in waggons.

The banana is sometimes attacked by a fungus (*Marasmius*), but, according to the most experienced planters, the disease does not appear to have any effect on healthy trees. The fibre of the stems is not sufficiently good for rope-making, but might be used in the manufacture of paper.

TREATMENT OF ZINCIFEROUS ORES.

In connection with the treatment of complex sulphide zinc-silver lead ores of Broken Hill, it is stated that the process carried out at Cockle Creek Works of the Sulphide Corporation is one of direct smelting and is of great simplicity. It does not require the intervention of new plant and, while free from any of the troubles inseparable from wet methods of treatment, electrolysis, etc., has, up to the present, developed none of its own. It consists in the direct distillation of zinc-lead "middlings" and zinc "concentrates," or the ore itself, from the calcined material in the ordinary zinc retort plant, by a method which prevents the destruction of the retorts by the liberated lead and also precludes the volatilization of the lead with the attendant silver losses into the spelter. The essential feature of the process is stated to consist in treating the ore in the first instance as a zinc ore, and using bituminous coal instead of anthracite, the soft coal being readily obtainable in unlimited quantity, and cheaply, from the collieries at Newcastle. The effect of using coking coal is the formation of a coherent coke in the retort which has the property of holding up in its pores all the metallic lead and silver contained in the charge, the resultant briquette being in an ideal state for further treatment, forming to a great extent its own fuel. Being thus held up in minute beads which entirely permeate the hard cake, the lead is completely prevented from running together and soaking down through the charge on to the walls of the distilling retort. Destruction of the retort on this account is therefore entirely obviated, while, since practically none of the lead passes off with the distilled zinc, the product is of remarkable quality; the impurities in the zinc amount to only 1 per cent. as against 2 and 3 per cent. and over from the previous methods of distillation. At the inventor's experimental works in England over 80 per cent. of the zinc has been recovered as against up to 70 per cent. at Cockle Creek. There is a complete recovery of the lead and silver for ordinary treatment.

LECTURES AND PAPERS.

THE ANGLO-RUSSIAN LITERARY SOCIETY.

At a meeting of the Anglo-Russian Literary Society at the Imperial Institute on November 4, Mr. E. A. Cazalet, President of the Society, in the chair, the Reverend Mr. Arthur Thompson kindly read two papers in the unavoidable absence of their authors.

The first one, entitled *Golden Links*, was by Miss Ropes, who, Mr. Cazalet explained in his opening remarks, had written no less than seventy tales and stories besides collaborating with her brother, Mr. Arthur Reed Ropes, on the recent novel, *On Peter's Island*, which showed an intimate knowledge of contemporary Russian life. Mr. Ropes was well known as a lyric writer who, under the *nom de plume* of Adrian Ross, had written the libretti of *San Toy*, *A Greek Slave*, *The Messenger Boy*, etc., etc.

Miss Ropes's short and graceful essay dwelt upon the great need for a closer acquaintance with one another by England and Russia. Only by this means could more friendly relations be really established. This closer acquaintance it was the aim of the Anglo-Russian Literary Society to bring about. It strove to encourage the mutual interchange of thought and opinion, with a view to a more complete understanding of the conditions under which the two nations thought and wrote, and it enabled us to show our appreciation of the great efforts put forth by Russian pioneers of modern literature and sometimes briefly to review their work.

It was a wholesome and a very enlightening experience thus to look into the heart of another country through the windows which its own authors had made. What we saw through these windows was more likely to be the plain, unvarnished truth than any of the superficial comments of mere visitors and travellers.

The second paper by Mr. Parker (Professor of Chinese at Owen's College, Manchester), entitled *Sven Hedin and Lob Nor*, was of special interest, coming before the Society as it did just before the appearance of Dr. Sven Hedin's book on the same subject.

The paper, which was necessarily somewhat abstruse and not easy to grasp at one sitting, consisted of a careful summary of information collected by Mr. Parker from the Chinese dynastic histories, and bearing upon the regions visited by the great Swedish traveller.

In the course of his paper Mr. Parker quoted the opinions of some Russian authorities on the subject, and also referred to the great Italian traveller, Marco Polo, whose Chinese wanderings took him, more than 600 years ago, into these same little-known regions. Marco Polo had travelled from Cotan (Khotan) through Peim Ciagian (Cherchen) to the city and desert of Lob. The city of Lob was placed by him at the entrance of the desert of that name, "consisting of mountains and valleys of sand." Four Chinese histories made allusions to these drifting sands, two specifying the particular one where old camels gave warning of approaching winds, as being "north-west of Tsumoh;" a third as "north-west of Shen-Shen;" and a fourth as "north-west of the 'Tu-Ku'-hun" (who occupied part of the country in the fifth century). Marco Polo also described the traditions of mysterious sounds and voices in the desert, at the end of which was the city of "Sacchiou" (Sha Chou or Tun-hwang).

After reading the paper with helpful explanations, Mr. Thompson made some remarks, dwelling upon the great interest which he had always felt in Marco Polo, and expressing the hope that Mr. Parker would some day contribute another paper to the Society, dealing more fully with the experiences of this thirteenth century traveller.

PROCEEDINGS OF INSTITUTIONS.

THE INSTITUTION OF CIVIL ENGINEERS.

The 85th session of the Institution of Civil Engineers was inaugurated on the 4th ult., when the President, Mr. J. C. HAWKSHAW, in the course of his address, said that the last century would always be memorable for the birth and growth to maturity and, as some said, to an honourable old age of traction by steam power on railways. Far-reaching as the results of this growth had been throughout the world, this country could not have reaped so rich a harvest from it without a corresponding growth of our dock system, which had also made its mark on the 19th century. Seeing how well provided our home ports now were with quays, alongside which vessels could be loaded and discharged in the shortest possible time, we might do more to give our Indian Empire similar advantages. The absence of such wharves on the long seaboard of 2,000 miles from Calcutta to Bombay increased the cost of goods landed or shipped from the ports there, and might cause serious inconvenience in war time.

The report of the Royal Commission appointed in 1900 to enquire into the administration of the Port of London emphasized the fact that our trade was growing faster than our ports were being fitted to accommodate it. When existing dock companies could not meet the expenditure called for by the ever-growing size of ships and the demands for more rapid means of loading and discharge it was well that the docks they owned should pass into other hands, as they had already begun to do. We owed our docks to our tidal rivers; but the advantage we derived from the rise of tide in our rivers ceased to be so great now that the time had come when not only deeper docks were required, but when such costly structures as locks with their gates and machinery had to be made to meet the requirements of the large ships of to-day. A lock entrance demanded a special site, and often limited the extension of the dock which it served, and thus to some extent we were now handicapped by our tidal rivers, which were formerly so much to our advantage.

The limit in the size of iron ships on many ocean lines had now been reached, being determined by the accommodation at the ports to which they ran. That we required deeper docks with deeper entrances to them was because iron had taken the place of

timber in shipbuilding, so that the use of iron had not only revolutionized shipbuilding, but had necessitated the rebuilding of our docks and harbours. The progress of the last century had been mainly due to the use which had been made of iron.

The president then dealt at considerable length with the uses of timber and the question of forestry. Engineers in this country, he said, could not do without timber, nor, indeed, without much timber. To take mining, last year 1,879,810 pit-props were imported into this country. On railways in the United Kingdom there were in use about 90 million sleepers, and the annual consumption for renewals was about 3,750,000 sleepers a year. Much timber was also used by railways for other purposes, such as fencing, telegraph and signal posts, buildings, and rolling stock. Another large item was timber used for temporary work. For instance, at the Alexandra Dock at Hull the timber used in the permanent work was 482,000 cubic feet, and that for the temporary work 1,500,000 cubic feet. The value of the sleepers in the road in the United Kingdom was about £18,000,000, and the annual cost of renewals about £750,000; to this must be added a further expenditure of about £500,000 a year for timber used on railways for other purposes, giving a total yearly expenditure of £1,250,000, exclusive of what was required for rolling stock.

The average life of timber sleepers in this country appeared to be 24 years, which was not far short of that of steel rails. In this country we had not kept to timber sleepers solely on the ground of economy, but because they gave a better road, more comfortable to travel on and less destructive to the rolling stock, less liable to accidents from broken rails, and affording facilities for repairs and alterations for junctions and sidings. Nevertheless, unless the world looked to its forestry, an iron permanent way was an evil which would have to be adopted. The number of timber sleepers laid on all the railways of the world would not fall short of 1,495,000,000, and a low estimate of the value would be £180,000,000.

Reckoning also the timber which was still required for engineering work, he thought it might be well to enquire whether the supply of the material was likely to continue to be equal to the demand. Mr. Hawkshaw, who said that he had taken much interest in forestry for the last thirty years, during which he had had some practical experience of planting in this country, and of late years in growing and converting timber in Norway, described the forest areas of the world, and said that in this country we had less area under forest than any other country in Europe except Portugal, and our timber imports were, in weight, more than half the total timber imports of the timber-importing countries of Europe. The only country we could look to for the timber we require was Canada, which country had still 38 per cent. of its area forest, or nearly 800,000,000 acres, not more than one-third of which, however, was timber-producing.

The United States was making increasing demands on Canada for timber, and Canada itself would soon be a large consumer of its own forest produce. In this country forestry had been neglected, and Great Britain might be regarded as the most backward of all civilized nations in recognizing the necessity of action with regard to forest resources. He hoped that the labours of the committee appointed by the Board of Agriculture this year to enquire into the subject would result in steps being taken to remove this reproach.

The president touched upon other subjects, and in some concluding remarks said that the advance in natural knowledge and the progress in our well-being during the last century had been the outcome of mechanics; and daily the lives, not only of communities, but of individuals, became more dependent on machinery, so that, with the extension of engineering to all science and art and to all trade and commerce, it was inevitable that engineers would more and more tend to become specialists.

THE ROYAL AGRICULTURAL SOCIETY OF ENGLAND.

The usual monthly meeting of the Council of this society was held on the 5th ult. In the unavoidable absence of the President (H.R.H. THE PRINCE OF WALES, K.G.), EARL SPENCER was called to the chair.

The chief business before the Council was the consideration of the proposals of the Stock Prizes Committee for the composition of the prize-sheet for the society's show of 1903, to be held at the new permanent showyard in London from June 23 to 27.

Mr. Sanday reported that the committee had drafted a schedule in which all the established breeds of horses, cattle, sheep, and pigs in the country were represented by classes and prizes. The amount of the annual grant, which had heretofore been made, for prizes at the show to be offered from the society's own funds, had for a number of years been fixed at £5,000, which had been supplemented by the local committees of the various districts which the society had visited to an amount ranging from £1,000 to £1,500. This source of additional prize-money was, of course, no longer available under the altered circumstances of a fixed showyard in London; and, as it was the view of the Stock Prizes Committee that the amount of prize-money should be at least equal to what had been offered before, he now asked for a grant of £6,500 for next year's prizes. The committee had in the draft preliminary prize-sheet made an allocation of this amount amongst the different breeds of live stocks, giving as far as possible an equal number of classes to all the leading breeds. He was hopeful that offers of additional prizes might be received from a substantial number of various breed societies which now existed in all parts of the country for the purpose of encouraging the particular breeds they represented. A sub-committee had conferred with members of the governing bodies of these breed societies on Monday last, at which 36 distinct breeds of stock were represented. The representatives had expressed their appreciation of the society's action in convening the conference, and a general desire on their part had been manifested to co-operate with the society. The committee thought that exhibitors of live stock might fairly be asked to pay an entry fee to cover the erection of the shedding and the cost of forage for the animals, and the fee for each entry of live stock had, therefore, been fixed at £1 for members and non-members double. After discussion the recommendations of the Stock Prizes Committee were adopted with four dissentients.

Mr. Frankish brought up a report from the Implement Committee, which was adopted by the Council, and which recommended that the charges for space for agricultural articles in the Implement Department for the meeting of 1903 should be fixed at 4s. per foot for ordinary shedding, 10s. per foot for high shedding, 12s. 6d. per foot for machinery in motion, and 10s. per foot for special shedding.

On the motion of Sir John Thorold, chairman of the Committee of Selection, Mr. Percy Crutchley was appointed hon. director of the show of 1903, and Mr. Sanday was appointed steward of forage for the same meeting.

Mr. Dugdale presented a report from the Dairy Committee, which recommended that prizes should now be offered for wool, hops, etc. They also recommended that competitions of buttermakers should be held in the dairy in the showyard.

Mr. Crutchley, Chairman of the Site Committee, reported that the London and North Western Railway Company had resolved to extend their line from Willesden, and to construct a passenger and goods station on the north side of the canal close to the north-east corner of the showyard. Estimates for the construction of the roads and sewers, inside the showyard, and for other works connected with the preparation of the ground, were recommended for acceptance.

Mr. Cecil Parker presented a report by Professor McFadyen to the Veterinary Committee on the outbreaks of contagious diseases of animals during the last four weeks for which returns had been published. The report stated that the outbreaks of anthrax numbered 33, and the animals attacked 47, as against 52 outbreaks and 58 animals attacked in the corresponding four weeks of last year. The outbreaks of glanders numbered 87, with 172 animals attacked, last year's corresponding figures being 106 and 195 respectively. Only

78 outbreaks of swine fever had been notified, as against 103 outbreaks in the corresponding period of last year. No fresh case of rabies had been detected since the last meeting.

The Council adjourned till December 10.

THE ROYAL GEOGRAPHICAL SOCIETY.

A meeting of the Society was held on the 11th ult., at which Professor John Milne, F.R.S., read a paper on "World-shaking Earthquakes." The President, SIR CLEMENTS MARKHAM, F.R.S., was in the chair.

Professor Milne, in his paper, divided earthquakes into two groups—first, those which disturbed continental areas, or even the world as a whole, which he called macroseismic, and, secondly, local earthquakes disturbing a few miles' radius, or not more than 100 or 200 miles, which he called microseismic. Evidence of the existence of large earthquakes was sometimes afforded, even though they could not be felt; for example, in 1755, the motion of the water in lakes and ponds observed in England, Scandinavia, and North America was attributed to the earthquake at Lisbon. Another form of evidence was sometimes discovered by astronomers, as in May, 1877, M. Nyren observed disturbances in the level of the axis of the transit at Pulkova, which were held to be due to an earthquake about an hour and a quarter earlier at Iquique.

The first instrumental record obtained by the writer of an earthquake which could not be felt was in March, 1884, and was the result of what might be termed "slow earthquakes." A long series of observations justified him in saying, in 1883, that every large earthquake might be recorded at any point on the land surface of the globe. Thus a new field was open to seismologists, and recording stations were now to be found in many countries, the most complete organization working in connection with a committee of the British Association.

A large earthquake seemed to propagate a series of waves in all directions over the world's surface. Describing in detail the character of this motion, he said that the large waves of earthquakes seemed to pass beneath a country like ours with the character of an ocean swell. The matter was still in process of investigation and there were reasons for and against any conclusions which might be reached. It would appear that the effective rigidity of the world was about twice that of steel, and it was easy to measure the difference in time between the arrival of preliminary tremors and of large waves—the former reaching a place 80 degrees from their origin in about fifteen minutes, whilst large waves took about fifty minutes. The distance ascertained from several distant stations, the origin might be easily located.

Another method of ascertaining origin was the difference of the times of arrival at different stations of large waves, and by these methods the origin of the world-shaking earthquakes for 1899, 1900, and 1901 had been determined.

Professor Milne established a relationship between the distribution of the origin of large earthquakes and the pronounced irregularities on the surface of the earth by a number of illustrations taken from the Alaskan region, which had yielded large seismograms to the Cape of Good Hope, which was antipodean to Alaska, the Cordillerean region, the Antilles, the Andes, Japan, and other parts of the world. He also gave an historic account, dating from 1692, of the mass displacements which had been caused by great earthquakes. As examples, in 1855, in New Zealand, 4,600 square miles were raised 1 foot to 9 feet; and in 1897, in Assam, according to Mr. R. D. Oldham, 10,000 square miles of country were displaced possibly 16 feet along a thrust plane. He also analysed at some length the connection between large earthquakes and volcanic activity; and again, starting from 1692, gave instances of the seismic convulsions which apparently resulted in these reliefs of volcanic strain. So recently as the early part of last summer the symptoms of volcanic and seismic activities in the Western Hemisphere culminated in the terrible explosions in Martinique and St. Vincent.

Professor Milne also gave the result of enquiries into the relationship between world-shaking earthquakes and unusual movements of magnetic needles. A comparison of the varying number at different periods of small earthquakes showed that the number recorded increased; but this was evidence not of the growth of seismic activity, but of more general observation. Nearly all large earthquakes were followed by a long series of after-shocks. For example, after the disturbance of October 28, 1901, which had its origin in Central Japan and which might be regarded as a typical world-shaking-earthquake, during the first twelve months 2,956 shocks were noted. Next year the number fell to 391. The conclusion seemed to be that in any given year there were 27,500 shocks which could be recorded in epifocal districts, and that, on the average, there annually were 30,000 small earthquakes. From seismograms obtained in epifocal areas measures of earthquake energy had been obtained. The result was that engineers and builders were now able to build so as to withstand known forces, and in Japan, in particular, effectual methods had been adopted to resist the severe shakings to which that country was subject. The Japanese Government had so far recognised the importance of seismology as to establish professorships to encourage its study.

THE AFRICAN SOCIETY.

The first general meeting of the African Society was held on the 5th ult., when Lord Avebury (the President) occupied the chair.

Lord Avebury said that Africa had three great claims upon their attention. Of all continents it was, firstly, the least known; secondly, the least civilised; and thirdly, it was the one for which they were most responsible; so far from making a profit England had never attempted to derive any pecuniary benefit from any of her colonial possessions. They would be fortunate if they recovered from the goldfields of the Transvaal one-half the expense it had cost them to free them from the corrupt tyranny of Mr. Kruger, and secure them a voice in the government of the country to which they contributed almost the whole of the income. In fact, in the English sphere of influence they acted as trustees. They sought no benefit from the nations for themselves, and claimed no advantage over other countries. If Customs duties were levied their manufacturers paid the same as those of other countries. But was this state of things fair to them or just to the natives? They admitted German, French, and Portuguese goods into their Crown Colonies on the same terms as their own, but the Germans, French and Portuguese attempted to exclude ours by heavy duties, and in some cases by actual prohibition. The general policy pursued by all European nations except their own of imposing differential duties in support of their commerce was one against which they might justly remonstrate, not only on behalf of the merchants and manufacturers, but in justice to the natives themselves. Of fair and friendly rivalry they could not complain. The partition of Africa could only be justified if the nations of Europe regarded their possessions as a sacred trust; if they endeavoured to lift the black pall which had so long overshadowed the "Dark Continent," and to brighten the lot of the unfortunate natives for so many years the victims of tyranny and oppression, but for whom they might venture to hope that brighter times were now in prospect.

THE ROYAL STATISTICAL SOCIETY.

The first ordinary meeting of the present session of the Royal Statistical Society was held on the 18th ult., Major P. G. Craigie, C.B., the president, in the chair.

The President, in the course of his annual address, said that the foremost topic to which the rule and plummet of the statistician had to be applied was that of the numbers and

distribution of the population. This must be the governing figure which dominated any statistical enquiry into the "conditions and prospects of society." He referred to the growth of population disclosed by the recently published figures of the various censuses. The population of England had increased 132 per cent. in the 70 years between 1831 and 1901. England was much less the predominant partner in the United Kingdom at that early date than she was to-day. In 1831 she mustered but 58 per cent. of the total population of these islands; to-day the proportion was 78 per cent. Looking outside our own country, he stated that in 1830 the population of Continental Europe must have been about 192 millions, whilst that of the whole world was probably 847 millions. To-day the world was calculated to contain not less than 1,600 millions, of whom about one-fourth were in the conventional Europe. Were a like comparison to be ventured upon as regarded the areas of the world's surface then and now under British rule or British protection, the older estimates, defective no doubt as to unoccupied areas, did not exceed $2\frac{1}{2}$ million square miles, the latter surfaces reached $12\frac{1}{2}$ million square miles. This advance was relatively much greater than that of the estimated populations on the areas concerned. If the estimate was accepted, it meant the exchange of a responsibility reaching 70 years ago to some 4 per cent. of the land of the world, for one which embraced well-nigh 24 per cent. of that area—and this without including the existing British commitments on the Nile for the good government and control of no insignificant population and no unimportant area in Egypt and the Sudan.

Whether it was an advantage or not to the conduct of diplomacy—and the question might be left to be answered by some of their Foreign Office friends, whose co-operation, he feared, they did not often secure in the Royal Statistical Society—the world as it grew older, it would seem, inclined to concentrate power on a smaller number of political centres. Six States, and six only, appeared at the present day to govern or protect some three-fourths of the world's population, and when ten States had been named, something like six-sevenths of the peoples of the globe had been grouped and classified. Two great Empires now alone accounted for something like half the population of the world—Great Britain and China—adding a comparatively known to a comparatively unknown statistical factor, hypothetically absorbing between them a multitude as great as all the world held a century ago, and one which pressed close upon, if it did not exceed, 800 million souls. The direct subjects and protected races falling under the widely-stretched sway of King Edward in distant corners of the earth were believed to somewhat slightly exceed the compacter masses which crowded the series of contiguous territories owing more or less allegiance to the Imperial Court of Peking.

Speaking of the essential differences between the relative strength of the peoples of 1834 and those of 1900, he said that Europe might have a little less than doubled its population, but even the much greater population of Asia had increased in nearly equal ratio. Meanwhile, the new world's development and the share of it which was due to the European overflow was common knowledge. The latest figure of the International Statistical Institute would mean a growth of 85 per cent. in the population of Europe in 70 years. But the factors in this aggregate should be dissected. Two, at least, needed further examination and enquiry. The Russian increment alone was close upon 70 millions of the whole. This suggested a hypothetical growth of population equal to more than 150 per cent. in 70 years, or more than 2 per cent. per annum, and left to the rest of Europe a general growth at less than half this rate, or only 67 per cent.—less than 1 per cent. per annum.

But the Russian figures before 1897 were open to a certain suspicion, and so a more trustworthy conclusion might be reached by comparing only the returns of Western European countries. In his review of these the president pointed out how in the 70 years Germany had added 88 per cent., whilst the United Kingdom had increased 70 per cent., and France had added less than 20 per cent. to her population. This brought the author to the consideration of the numbers of people who had left our own and neighbouring countries for oversea lands, to the fact that the growth of modern population was in big cities, and to the relative decline of rural population, which was noticeable in other countries besides our own.

In the lifetime of the society very nearly five persons to every ten added to our home stock had gone to build up the closely related State which dominated, as far as population was concerned, the continent of America; about one person for every ten of the nation's increase in our own islands had in the same interval gone to Canada, and another one for every ten to Australia. The subject of emigration, both from our own country and from other European nations, deserved, however, attentive study by itself on a scale which could not be attempted in a general address. A significant mass of statistical data was ready for consideration in the annual volumes which the Board of Trade now provided. Commenting upon the movements of the population he alluded to the growth of London and other great cities on the Continent, and said that, look where we would, even in our own Colonies, where the broad acreage of Canada or Australia so proudly impressed our admiration, the immigration seemed more and more to concentrate itself on setting up as soon as possible an urban community. The latest census figures at least suggested that urbification was going on even there apace, and that it was not wholly, or even mainly, the filling up of the interior with sturdy agriculturists, prepared to wring a livelihood from the soil by the most primitive of arts, that marked the situation of to-day. Concurrently at least with this, growing numbers of the immigrant population were being assigned to the secondary businesses which new cities might afford under sometimes artificially stimulated industrial activity of these new self-governing States within the Imperial fold.

The president then glanced at the growth of our revenue and of our wealth. He took as a special index of progress the growth of house property, and quoted figures to show that whereas 70 years ago 8 per cent. of the dwellings of Great Britain were of £20 and upwards rental, to-day rather over 16 per cent. exceeded that figure; and, as a proof of the improvement in the condition of the people, he mentioned the fact that there was much less growth in the relatively small class of the higher-rented houses. It was a huge material fact, which must strike any candid enquirer into our internal national condition, that in the "house property" of the kingdom stood an incontestable and visible form of the accumulation and investment of individual capital.

In conclusion, he remarked that the statistics with which he had been dealing showed that our country was vastly bigger and a vastly more complicated machine than our fathers had to deal with when the society was founded; that it had grown in numbers, in wealth, and in power; grown, too, enormously in proportion in territorial responsibilities—responsibilities which might yet entail sacrifices that would test the national spirit, courage, and perseverance.

If the land of "All the Britains" was to be occupied, held, and developed, we must more seriously resume that "export" of brave and courageous men, ready to fill the waste places of the earth, and where government fell on the shoulders of our race, to take up the burden with a stout heart and confidence in our national future. We could make our Empire strong by expansions of this type, rather than by the mere planting of colonial towns on the fringe of unoccupied regions.

The most casual survey of the dimensions to which, after 70 years, the political fabric of the British Empire had attained, enforced the lesson that fully to hold our own with other growing nations, and rightly to discharge the world-wide responsibilities which Providence had entrusted to us over subject races, there must be no slackening of our capacity for serious duty and serious work at home, no resting on the bygone reputation of our fathers for industrial enterprise abroad, no hesitation in facing the newer political problems of these altered times. If largely growing urban conditions and augmenting dependence on distant lands for

much of the raw material of our home industries, and for a considerable share of our food supply, were imposed upon us by the economic condition of the present, the obligation was all the more enforced to maintain that mastership of the sea which in the past had served to unite rather than to sever the scattered factors of the British Empire, and which had kept open to our teeming population unrestricted highways for trade with all the regions of the globe. That the home nation still grew and strengthened in material wealth his figures showed. The statistician recorded that much for their satisfaction and encouragement.

He found, however, that the great Empire resting on the fulcrum of these islands was still building and expanding, and he pointed to the obligations its future maintenance must entail. We must not be content, therefore, to sit down and admire the proportions of the edifice, but one and all determine by personal effort where we might, and by a readier tolerance, in all cases, to any claims of the nation on the private purse, to face with courage and with perseverance the task of holding what the Empire-builders of the past had won, remembering that "not once or twice in our bright island story the path of duty proved the way to glory."

FUNCTIONS AT THE INSTITUTE.

THE LONDON NEEDLEWORK GUILD.

In the north gallery of the Imperial Institute, the garments and other articles made and collected during the past year by the members of the London Needlework Guild for distribution among the hospitals, missions, prisons, refuges, and poor parishes of London were exhibited on the 7th and 8th ult. The total number of articles sent in this year is 54,755, and, though this number is rather smaller than that of last year, the garments are of much better quality. The Princess of Wales, who succeeded her mother, the late Duchess of Teck, as patroness of the guild, and takes considerable interest in the work, is again the largest contributor, her Royal Highness's collection consisting of 12,300 articles. These comprise a contribution by the King of 59 articles of men's clothing, and about 300 miscellaneous articles, including six woollen petticoats made by the Princess herself, and some well-stuffed pillows by the Prince of Wales. Included in Her Royal Highness's collection also are several warm woollen scarves, a hood, and other articles, the work of Princess Victoria, a number of woollen comforters worked by Prince Edward and Prince Albert of Wales, who also contributed other articles purchased out of their pocket money, and two pairs of cuffs worked by Princess Victoria of Wales. Princess Edward of Saxe-Weimar sent a collection of 402 articles. The next largest collection to that of the Princess of Wales was sent by Mrs. Basil Ellis, numbering 2,654 articles. Mrs. Ellis, who is one of the honorary secretaries, has received from the children attending the village school at Oxshott, Surrey, between 300 and 400 garments, which they have made with materials that she has supplied. At her invitation these school children visited the exhibition on the 7th ult. Princess Edward of Saxe-Weimar was also present during the afternoon. Lady Harcourt sent 2,586 articles, and a collection of 1,602 was received through the Hon. Mrs. Holford. All of the ladies named are presidents of groups, of which there are 122. The members of these groups make the garments during the year, and they are collected by their several presidents for the purposes of the exhibition and distribution. A private meeting of the committee was held on the 10th ult., for the allocation of the garments: nearly all the London hospitals participated in the gifts.

COMMERCIAL INTELLIGENCE DEPARTMENT.

CORRESPONDENCE AND ENQUIRIES.

The following are given as specimens of some of the enquiries which have been addressed to, and satisfactorily answered by, the Institute during the past month (November).

*** All communications must be authenticated by the name and address of the writer. Enquiries which would involve special applications or expense will be a matter of arrangement with the correspondent.*

- E. H. W., *London*.—Agriculture in Natal.
- W. B., *Kent*.—Production, consumption, etc., of beer and hops in the United Kingdom.
- P. B. W., *Norwood*.—Tea-planting in Natal.
- M. C., *Hampstead*.—The Dragon tree and "Dragon's Blood."
- E. R., *London*.—Names of publications which are the best sources of information on the markets of the world.
- B. T., *London*.—Palmetto leaves for paper-making.
- E. E. S., *Oxford*.—Agriculture in British East Africa.
- V., *London*.—Fruit-cultivation in Jamaica.
- B. C., *London*.—Gold Coast.—Climate, health, outfit, etc.

CITY BRANCH:—

- Traders in Penang and Singapore.
- Publications noting building operations in Colonies and India.
- Imports of rice at various ports in South Africa.
- State of petroleum industry in Russia.
- Industrial conditions in Cuba.
- Import duty on petrol in India.
- Commercial travellers' licences in South Africa.

REQUIREMENTS REGISTRY.

SPECIMENS OF FOREIGN AND COLONIAL WOODS desired. Purchase or exchange. Names and localities must be well authenticated. Address—**HERBERT STONE, BRACEBRIDGE-STREET, BIRMINGHAM.**

THE CURATOR OF THE CANADIAN SECTION OF THE IMPERIAL INSTITUTE is prepared to furnish information about Canadian Trade and to supply names of importers, manufacturers, shippers, etc.

The following trade enquiries have been received at the Canadian Section of the Imperial Institute, from the Curator of which Section further particulars may be obtained:—

Home Enquiries.—A Dublin firm desires the names of Canadian dealers who can supply turkey quills in quantity.

An enquiry has been received for the names of Canadian producers of slates.

A company manufacturing pumping machinery wish to secure the services of a first-class firm of resident agents to introduce their goods into Canada and, more particularly, British Columbia.

A London importing firm is prepared to take up the sale of a first-class Canadian lawn mower, and invites correspondence from manufacturers of same.

An enquiry has been received for the names of Canadian shippers of green and blue marbles, etc., suitable for decorative purposes.

A Liverpool firm desires names of Canadian shippers of molybdenum of good quality.

Enquiry is made for the addresses of the leading Canadian dealers and shippers of wool.

A company manufacturing electric fans, hydraulic rams and other specialities asks to be placed in communication with first-class Canadian firms who would be prepared to act as the company's resident agents.

An enquiry has been received for the addresses of Canadian firms who can supply semi-circular wooden strips as used in the manufacture of cane trunks.

A manufacturing company in Cornwall desires names of Canadian manufacturers of box shooks who can quote upon specification for prompt delivery.

Canadian Enquiries.—A timber manufacturer in the province of Quebec invites correspondence from United Kingdom importers of box boards cut to specification, also of spool and bobbin wood.

A Canadian correspondent who owns a partly-developed deposit of molybdenum would like to hear from persons interested in obtaining supplies of this metal.

A Canadian company manufacturing washing machines, wringers, wheelbarrows, and other goods asks to be placed in communication with United Kingdom importers of same.

A Canadian house dealing in druggists' and kindred goods, and able to furnish first-class United Kingdom references, wishes to obtain a good agency for brushes of all kinds.

MAPS AND CHARTS.—RECORDS.

[The entire collection of maps (with the exception of a few atlases and maps issued by private firms) consists of authoritative publications of the various government cartographical departments. Such as: the One-inch Ordnance Survey of Great Britain and Ireland, a complete set of Admiralty Charts, and a selection from the maps compiled in the Intelligence Division of the War Office; the monumental "Indian Atlas," and a large number of the publications of the Surveyor-General's office, Calcutta; the Geographical Survey of Canada, and the Government Surveys of Victoria and New South Wales. In the arrangement of the collection, the geographical classification of the War Office Intelligence Department catalogue has, with some modifications, been followed.]

ADDITIONS TO THE COLLECTION OF MAPS DURING OCTOBER, 1902.

ASIA.

India. Surveyor-General's Office, Calcutta.

INDIAN ATLAS, quarter sheets 20 N.E., 40 S.W., 51 S.W., 60 N.W., 64 S.W., 69 S.E., 78 N.E., 105 S.W., 124 S.W., 125 S.W.
CENTRAL INDIA AGENCY, sheet 54.
BURMA AND ADJACENT COUNTRIES, 1901.
THE CENTRAL INDIA AGENCY, 1901.
NORTH-WESTERN PROVINCES AND OUDH, 1901.
LOWER PROVINCES REVENUE SURVEY, sheets 12, 15.
DISTRICT SURAT, 1902.
ASSAM SURVEY, sheets 8, 9, 38, 49, 52, 62, 63, 163.
BURMA SURVEY, sheets 125, 190, 240, 244, 255, 305, 307, 354, 435, 436.
BOMBAY SURVEY, sheet 135.
BENGAL SURVEY, sheets 111, 143, 308.
MADRAS SURVEY, sheet 74.
NORTH-WESTERN PROVINCES AND OUDH SURVEY, sheets 70, 85, 168, 195.
" " " " AND BENGAL SURVEYS, sheet 214.
SOUTH-EASTERN FRONTIER, sheet 4.
DISTRICT ELLICHPUR, 1901.
" GOALPARA, 1901.
" SYLHET, 1902.
CHART OF TRIANGULATION (BURMA FOREST), sheets 257, 258.
" TRAVERSE (BURMA FOREST), sheet 213.
" TRIANGULATION (BURMA), sheets 253, 255.
INDEX TO PROVINCIAL MAP OF CENTRAL INDIA AGENCY.
" " " NORTH-WEST PROVINCES AND OUDH.
Presented by the India Office.

CHARTS AND PLANS.

Published by the Hydrographic Department, Admiralty, during September and October, 1902;
J. D. POTTER, Agent, 145, Minorities, London, E.C.

No.	New Charts.
3185	Scotland, west coast:—Loch Sunart.
3287	Ireland, north coast:—Entrance to Lough Foyle.
3300	Baltic sea:—Windau.
162	Black sea:—Novorossisk bay (Sujuk), Novorossisk harbour.
3301	Africa, north coast:—Tenez road and harbour.
3305	Newfoundland, east coast, Bay Vertc:—Coachman harbour.
3223	Newfoundland:—Sunday cove island to Thimble tickles.
3297	Newfoundland:—Despair bay.
3290	Cuba, north coast:—Livisa and Cabonico bays.
3291	Cuba, north coast:—Port Tanamo.
3295	Plans on the east coast of South America:—Chubut river, Camarones bay.
745	India, west coast. Sheet VIII.:—Netrani to Mangalore.
71	Bay of Bengal:—Madras to Calimere point.
3299	China, north coast:—Shitau bay and approaches.
2423	Papua or New Guinea. Sheet III.:—Boigu island to Cape Blackwood.
100	Arabian coast. Plan added:—Sur anchorage.
1472	Australia, south coast. Plan added:—Koombanah bay.
2411	New Zealand. Plan added:—Entrance to Otago harbour.

Charts that have received additions or corrections too large to be conveniently inserted by hand, and in most cases other than those referred to in the Admiralty Notices to Mariners.

No.	No.
2010	England west coast:—Morecambe bay.
1191	England, east coast:—Flamborough head to Hartlepool.
1210	Ireland, south coast:—Berehaven.
3038	Norway:—Bjørnsund to Kristiansund.
565	Iceland, western portion.
2733	Iceland:—Portland to Sæfells Jökul.
566	Iceland, eastern portion.
280	Newfoundland:—Notre Dame Bay.
2857	East Coast of United States:—Potomac river.
424	Cuba:—Port Matanzas.
2344	Gulf of Mexico:—Mobile Bay.
550	South America, east coast:—Entrance of the river of São Francisco.
1911	United States, west coast:—Approach to Juan de Fuca strait.
630	British Columbia:—Port Neville, Forward harbour.
759B	Madagascar:—Antongil bay to Ambatosa.
1270	Korea:—Approaches to Chemulpo anchorage. Chemulpo anchorage.
1065	Korea:—Douglas inlet and Sir Harry Parkes sound.
1203	Japan:—Uraga Harbour.

A GOVERNMENT COMMERCIAL BUREAU FOR INDIA.

The Government of India has for some time past been considering a scheme for the establishment of a commercial bureau. The various agencies which have arisen in late years in different countries for furnishing commercial information, such as those in Philadelphia and San Francisco, and the branch recently established by our own Board of Trade, have no doubt impressed the Government with the desirability of doing something in the same direction for India. No one can disparage efforts that are made for fostering India's trade, on the development of which the future prosperity of the country so largely depends. Some, however, bearing in mind the spirit of individual enterprise which has built up the trade of England, may doubt the practicability of Government aid to commerce of any but the time-honoured and well-recognised kinds. The Government of India have, therefore, approached the question in a cautious and tentative manner by inviting the opinions of the mercantile community, through the Chambers of Commerce. It has, of course, been necessary to provide the outlines of a scheme, but the details are to be completed after consultation with the commercial bodies in India.

In a letter addressed to the Bengal Chamber of Commerce it is stated that Lord Curzon desires, before submitting his proposals to the Secretary of State, to ascertain what are the kinds of information which the commercial public would find useful, but which they cannot now procure, although it might be within the power of Government to supply it; and further, how such information could be conveniently displayed, and be made readily acceptable. Moreover, stress is laid on the fact that the official primarily charged with the collection and compilation of the information should enjoy the confidence of the commercial public. Government have been impressed by the defective nature of the arrangements for obtaining advice and information upon commercial and industrial operations in which the State is concerned, and still more noticeable has been the almost entire absence of machinery by which Government can systematically procure and communicate commercial information of interest to individuals or public bodies who may have difficulty in procuring it for themselves. The outline scheme which has been drawn up involves the establishment of a Bureau of Commercial Intelligence for India in connection with the Department of Finance and Commerce. The head of this new organization will be a specially-selected officer called the Director-General of Commercial Intelligence. Under his direct orders will be two assistants, one of whom will be director of statistics and the other director of the commercial branch, together with the requisite staff. The primary functions of the Director-General and

his commercial assistant would be to procure and publish all information likely to be of use to commercial men, including matters relating to foreign and internal trade, the industrial and mineral resources of India, the competition of foreign staples with local Indian products, and of Indian staples with foreign commodities abroad, the development of existing markets, and the discovery of new ones. The matters dealt with should include the Customs Tariffs and regulations of all countries, shipping dues, and the many subjects enumerated in the leaflet published by the Commercial Department of the Board of Trade. It is recognised that to procure such information constant and regular communication will be required with commercial, shipping, and labour organizations, and with representatives of particular trades in India; with the Board of Trade and commercial associations in the United Kingdom and throughout the British Empire; and with British Consuls all over the world. Besides periodical reports, statistical returns and special reports will be sought on subjects of particular interest.

The Director-General would communicate the information collected through three principal channels—(1) a library of carefully arranged information in books, reports, etc., which would be at the disposal of the public; (2) the enquiry office, in which information not readily available in the library would be arranged, registered, carefully indexed, and kept up to date, and in which the public would be aided by trained subordinates in obtaining answers to enquiries; (3) a periodical journal containing statistics, analyses of Consular reports, etc., such as the English *Board of Trade Journal*. The headquarters of the Director-General would be at Calcutta, but he would be required to visit the chief ports and great inland trade centres at convenient intervals. Lord Curzon is satisfied that, if that officer efficiently discharges his duties to the commercial public, his expert advice to Government cannot fail to be of the utmost value to Government. The Viceroy realises the danger that the work of the Bureau may degenerate into routine, and he foresees that at the outset mistakes may be made and omissions allowed to occur; but, without anticipating immediate and complete success, he is disposed to think that, if the officer to be appointed approaches the task in a sympathetic spirit and secures the active co-operation of the commercial public, a substantial measure of success will before long be achieved.

The Committee of the Bengal Chamber of Commerce, after consultation with the Committees of the Associations connected with the Chamber representing various branches of trade, and also members of the Chamber qualified to give an opinion, submitted their views in a letter of which the following is a summary. The scheme commends itself as a whole to the Committee as being calculated, if properly worked, to develop materially the trade of the country. The principal danger to be feared is that of allowing the work of the office to degenerate into routine. It is suggested that on the formation of the Bureau it would be desirable for one of the officials to visit the Philadelphia Commercial Museum and inspect its organization, and the information thus obtained would be of considerable value in framing the arrangements for the new office in India. With regard to the kinds of information which would be most useful, they are the exploitation of new markets and the improvement of their own manufactures, in order more effectively to meet competition from other countries. A vast amount of valuable information could be collected by British Consular agents abroad, and could be utilized for the benefit of the trade of the country by the Bureau of Commercial Intelligence. The officer at the head of such an important department would have no difficulty in getting into communication with the very best sources of information throughout the world. The Committee emphasize the fact that simple statistics, as such, are no longer of the great importance they used to be before the introduction of telegraph cables and rapid steam communication, and care would have to be taken to prevent the Bureau becoming a mere department for the collection of trade statistics, valuable to a certain extent as these might be. Information that would assist in the establishment of new industries would be of the utmost value, and in this connection the Committee consider that the Bureau might render valuable assistance in connection with the establishment and extension of great iron and steel industries in India. A suggestion is also made for the establishment of a special labour section of the Bureau, the object being to induce native workers to leave congested areas in favour of localities where labour is wanted and is well paid, such as the colliery districts and the neighbourhood of Calcutta, where the jute mills are situated. Reciprocal relations should be established with similar institutions in other countries, so that all possible information may be obtainable regarding foreign manufactures and industries. With regard to the best means of making the information collected readily accessible, there should be, in addition to the Head Enquiry Office at Calcutta, Branch Offices at Bombay, Madras, Karachi, and Rangoon. Unless this could be arranged the mercantile communities in those important cities would be at some disadvantage as compared with the commercial body in Calcutta. The Committee point out that some discrimination would require to be used as to the publication of information supplied to the Bureau. It is questionable whether individual merchants and manufacturers would supply information on many matters if it was understood that it was to be made available for the general community. Of course there would not be this danger in connection with information with regard to manufactures, inventions, etc., obtained from public sources, to which all have a right of access, but Government might reserve the right of not publishing information obtained in connection with specific enquiries. The Committee recognise the difficulty of selecting for the post of Director-General one in every way suited to carry out successfully the duties of the office. They consider that the choice should not be confined to members of the Government service. Selection should be made of the best possible man irrespective of the profession to which he may belong. It is necessary that the Director-General or one of his assistants should be possessed of a commercial training, with a wide knowledge and experience in Indian commerce in particular. The Committee recognise that there are members of the Civil Service possessing many of the qualities which would conduce to making the new office a success, but they trust that the area of selection will be made as wide as possible to secure the most fully qualified man for the post.

THE TWENTY-FIVE-KNOT CUNARD STEAMSHIPS.

In the *Scientific American* for November 1, 1902, the following interesting article is given on the Atlantic steamship service:—

"The contest for the high-speed transatlantic record has never seen a more interesting phase than that which it is now passing through. With the *Deutschland*, carrying a record to her credit of 23.51 knots an hour; with the *Kronprinz Wilhelm*, only a fraction behind the *Deutschland* in her average sea-speed, and showing, with each season, a steady improvement; with the great *Kaiser Wilhelm II.*, launched and well on toward completion, and giving promise of 24 knots an hour, and over; and with the plans for the two Cunard giants, designed to restore British prestige on the Atlantic, under consideration by various competing shipbuilding firms, it must be admitted that there never was a period in the history of high-speed transatlantic navigation more full of interest and promise than the present.

"It is not likely that even the officials of the Cunard Company know what the exact dimensions, horse-power and speed of the two new vessels will be, but we are reliably informed that, tentatively, the general features of the ships have been placed at 750 feet of length, 75 feet of beam, and a horse-power of about 50,000.

"Unless the directors change their minds, it is probable that the steam turbine will not be introduced on these vessels, for it is felt that, notwithstanding the excellent performance of this type of motor on the *King Edward VII.* and *Queen Alexandra*, it is too great a

step from an installation of turbines of a few thousand horse-power on a river steamer to the equipment of two costly vessels on which so much is depending as on the new Cunarders, with what is, as yet, a comparatively new type of motor. Hence, it is likely that the great horse-power of these ships will be developed upon two or three shafts. If twin-screws are used, the proportions of propellers, shafting and engines would be enormous, since they would have to develop and carry probably not less than 25,000 to 27,000 horse-power each. There is absolutely no precedent for such sizes and weights, the largest twin engines at present being those of the *Deutschland*, which, when the boilers have been steaming freely, have developed as high as 38,000 horse-power, or 19,000 on each shaft. The new *Kaiser Wilhelm II.*, it is true, is to have engines of 40,000 horse-power, or 20,000 upon each shaft, and in actual service they are likely to develop as much as 44,000, or, say, 22,000 on a single shaft.

"It is natural that the Cunard Company, in its endeavour to keep down the sizes of the separate engines, should turn to the triple-screw system of propulsion. By so doing each shaft would have to carry only 17,000 or 18,000 horse-power, or less than is now carried in the case of the *Deutschland*. The objection to triple screws is the very obvious one that the engine-room staff would have to be greater for three engines than for two. But, with this exception, it may be said that practically every other argument is favourable to the use of triple-screws. In the first place, judged from the all-important standpoint of safety of travel, there is less risk of total disablement in a triple- than in a twin-screw ship. If one engine is disabled only 33 per cent. of the power is lost, and the ship still has 66 per cent. with which to make port. The individual parts of the engine are much lighter, and hence it is easier to overhaul the engine in port or, in the case of a breakdown, to make repairs at sea. Although it might seem at first that more of the ship's space will be taken up by three engine rooms than by two, the difference is not so great as might be supposed, inasmuch as the centre engine would be located on the centre line of the ship, astern of the wing propeller engines, and would occupy space in the least desirable portion of the ship from the standpoint of passenger accommodation. Admiral Melville, Chief of the Bureau of Steam Engineering of the U.S. Navy, is a strong advocate of the use of triple-screws, not merely for the navy, but for the large transatlantic steamships. Speaking on the important question of economy, he has shown that in the case of the fast commerce-destroyers, *Minneapolis* and *Columbia*, which are fitted with triple-screws, there was a very decided economy realised by their use. Moreover, it is a significant fact that the French naval architects, who are among the best, if not the best in the world, and who are considered to have gone more deeply and thoroughly into the question of triple-screw propulsion than any other naval architects, appear to have adopted the triple-screw exclusively for all large ships of the navy. They claim that, quite apart from their obvious military advantages, triple-screws show a very decided economy over twin-screws. There is one other question which should be carefully considered in adopting twin-screw propulsion for transatlantic ships, and that is the question of vibration, which has so much to do with the comfort of passengers. It is a well-known fact that in the largest high-speed passenger vessels vibration is one of the most serious sources of discomfort. The effect of triple-screw propulsion in respect to vibration is a question which should receive a most thorough investigation.

"While speaking of vibration, one cannot but call to mind that the steam turbine, because of the absence of reciprocating parts, that is to say, of more or less unbalanced parts, is the ideal motor for passenger service. There is no question that the first transatlantic steamship that is fitted with a successful steam turbine will have a great advantage in this respect over high-powered boats driven by reciprocating engines. Broadly considered, it must be admitted that the success which has attended the installation of turbine units of great horse-power in electrical plants foreshadows the day when the steam turbine will be exclusively used in transatlantic travel. We cannot but think that the Cunard Company should give a most exhaustive study of the existing high-powered turbine plants before they decide that there is any inherent quality of the turbine which renders it unsuitable for use in tandem on the shaft of a transatlantic liner. Already turbines of 7,000 horse-power are under contract for electric railway plants. If they can be built in 7,000 horse-power, they can surely be built successfully in 9,000 horse-power units, and two such turbines on each of the three shafts of the Cunard boats would give the desired maximum horse-power and something over. In an accompanying editorial and in the current *Supplement* will be found most powerful arguments on the score of economy of cost, weight and space, in favour of the steam turbine, and every one of these arguments applies with just as much force to the engine room of a transatlantic liner as it does to the power station of an electric railway company."

THE RIPENING OF CHEESE IN COLD STORAGE.

The manufacture of cheese is one of the most important industries in Canada. Its extent may be illustrated by the figures showing the value of the supplies sent to the English market, which takes about nine-tenths of the total exports. Last year, 1901, the value of the imports of Canadian cheese into the United Kingdom was £3,697,660 out of a total of £6,227,135—the value of our imports from every source. That is, sixty per cent. of our imports of cheese were derived from Canada, and this proportion is increasing. The trade returns for the first ten months of this year show that Canada has so far contributed over 65 per cent. of our imports of cheese. That Canadian cheese is so greatly in demand in our markets is, of course, due to its superior quality and its low price. Great credit is due to the Canadian Government for the attention it bestows on the industry, and the efforts which are made by the Dominion and Provincial Departments of Agriculture to ascertain by means of investigation and experiment where improvements in manufacture and preparation for market may be possible.

The problem of ripening cheese in cold-storage is an important one and has been worked at both in the United States and in Canada. The latest information on the subject comes from the latter country, where Professors H. H. Dean, F. C. Harrison, and R. Harcourt, of the Ontario Agricultural College, have been occupied in experimental investigations bearing upon the matter. The *Bulletin* containing their report, which is published by the Ontario Department of Agriculture, Toronto, states that since the British market demanded a "fatter" cheese, or a cheese with softer body and texture, Canadian cheesemakers have been endeavouring to meet the demand, but have found some difficulty in doing so, from the fact that the average ripening (or curing) room at the factory is not adapted to holding such cheese for any length of time. In hot weather the temperature rises in the ripening-room with the rise of temperature outside. As a consequence, the cheeses "go off" in flavour, and in many cases develop a mealy texture. To overcome these difficulties, better constructed ripening-rooms and better means of cooling them have been advocated, and improvements in these directions have been made by a number of factories; but the majority are not yet in a position to make cheese with softer body. The labour of bringing ice to the ripening-room and putting it into the ice-boxes makes this method very expensive. The sub-earth duct has given fairly good satisfaction as a means of cooling the air in a properly insulated room; but it does not maintain the temperature much below 65 deg. in a 70 deg. F. Recently a movement has arisen in favour of central, or consolidated, cold-storage ripening (curing) stations. This plan has at least two circumstances to recommend it:—(1) it keeps the cheese safe from the effects of heat; (2) it enables buyers to do their work at very much less expense for inspecting the cheese. The disadvantages are:—(1) the expense of operating such stations; (2) the expense of shipping to them; and (3) the fact that, under such a system, the cheeses

are to some extent out of the hands of the salesmen—though there is no reason why one salesman should not act for several factories, instead of each factory having a salesman as at present. Co-operation and consolidation should be the watchwords of modern dairy enterprises. Too many small, poorly-equipped factories, which compete with one another for the small amount of milk in the locality, are a great injury to the Canadian cheese trade. The nature of the experiments, which are being repeated and extended this season, will be sufficiently understood by a glance at the conclusions so far arrived at. It has been found that an ice cold-storage chamber may be maintained at a temperature of about 40 deg. without moving the ice, if the building is well insulated. This high proportion of moisture in the cold-storage, amounting to 91.6 per cent., provided favourable conditions for the growth of mould, but this was no greater on the cheese in the refrigerator than on that in the ordinary ripening room; in both places the mould was kept in check by using a solution of formalin through a hand spray-pump. The saving of loss in weight, by ripening at an average temperature of 37.8 deg. for the season, was upwards of 2 per cent. on cheeses weighing about 30 lb. each; in a large factory this is an important item, and would alone meet the cost of cold-storage for cheese in hot weather. The quality of the cheeses was found to depend upon the order, as regards time, in which they were placed in the cold-storage, those put in directly from the hoops ranking first. An increased yield representing at least 1 lb. of cheese per 1,000 lb. (equal to 100 gallons) of milk may be expected as a result of modifying the method of manufacture and ripening at a lower temperature than has been usually supposed necessary. The assertion that cheese kept in cold-storage for any length of time will quickly spoil when exposed to an ordinary temperature was not corroborated, but further experiments are in progress on this point. A cheese transferred from the hoop into a dry box and placed in cold storage, without any turning, ripened satisfactorily, though with a large amount of mould. A cheese put into a box, after ripening in the ordinary room for a week, gave similar results. Undesirable bacteria, such as are found in cheese, seem unable to grow at a temperature of 38 degrees, and consequently had flavours in cheese, caused by bacteria, do not increase in cold-storage. The long life of lactic acid bacteria seems to have an important bearing on the question of ripening, in checking the development of bacteria which produce bad or undesirable flavours. The temperature at which cheese will cure best has yet to be ascertained.

DOMINICA.

In a new bi-monthly magazine entitled *West India*, devoted to the social and economic questions of the West Indies, the Hon. Francis Watts has written an interesting article on the Leeward Islands, the long chain extending from the Virgin Islands in the north to Dominica in the south. After a brief historical account of the group, a description is given of the various islands and their agricultural resources. Of Dominica, the Hon. Francis Watts writes as follows:—

Dominica, the largest and most southerly of the Leeward Islands, is the one which at the present moment is attracting most attention. From its extremely mountainous character it was never cultivated in sugar cane to the same extent as its neighbours, and when the price of sugar fell it was in Dominica that the depression was felt with the greatest keenness. This led to an extension of the lime industry, which has long been established in this island. With the development of limes, cacao soon attracted attention, and both these industries have made rapid and substantial progress within the last few years.

This island from the coast presents a rugged and unpromising exterior, but the interior is full of fine fertile valleys, along which flow rivers and mountain torrents in great number. This abundance of water, due to a heavy rainfall, in a tropical country means great fertility, hence these valleys, where not already cleared for cultivation, are filled with luxuriant forests, and, where cleared, with flourishing plantations of limes and cacao. Vast tracts of land are as yet scarcely explored; their exploration and subsequent cultivation are being facilitated by a series of new roads now in progress, which, when completed, will afford a future full of enterprise and promise.

The old roads of Dominica were few and bad, so that internal transport was difficult; this delayed progress greatly, for although produce might be grown in great diversity, the getting of it to market was difficult or impossible, hence most of the older estates were within easy reach of the sea, which thus served as the great high road, a high road which on the windward coast is often unavailable, on account of the heavy breakers which are driven upon that shore by the steady trade-wind. Transportation is now being greatly facilitated by the introduction of a well-built coasting steamer touching at all available places on both the leeward and windward coasts.

These improved means of communication by land and sea encourage the development of the country; indications are abundant that new enterprises are rapidly following, and that the prosperity of the island is advancing in a rapid manner.

Dominica appears to be capable of producing all those tropical products which require a good rainfall: limes, oranges, cacao, nutmegs, vanilla, bananas, coffee, rubber and others. The list might be extended to great length.

The lime and cacao industries at present engage the greatest attention, though other industries are not neglected; in course of time some of these may occupy a prominent place in the economy of the island. The lime industry is interesting from the diversity of its products. The fruit is exported in various forms; the juice in two forms, either as expressed from the fruit in condition suitable for the preparation of refreshing beverages, or it is concentrated by evaporation in copper pans to a dark, thick liquid which serves as the raw material wherefrom citric acid is manufactured in Europe and America. Two kinds of essential oils are obtained from the rind of the fruit; one is prepared by hand by rubbing the ripe fruit upon a saucer-shaped copper dish armed with many projecting spikes, which rupture the oil-sacs of the rind and cause the oil to flow down into the saucer where it is collected. Another form of oil is obtained by distillation from the juice; the first stage of the evaporation above mentioned is conducted in a still; the steam, being condensed, yields a considerable quantity of oil, which is readily separated from the water upon which it floats.

The cacao industry of Dominica is receiving more attention, from which there is resulting a considerable increase in the quantity exported as well as great improvement in the quality.

With the large amount of unoccupied and undeveloped land, with soil and climate capable of producing a wide range of tropical products, the prosperity of Dominica should yearly increase as the new areas are brought under cultivation. This is a condition which is particularly pleasing after the long period of depression which Dominica has endured and it is in refreshing contrast to the struggles, efforts, and economies of the sugar-producing islands.

THE DISTRIBUTION OF OCEAN PASSENGER TRAFFIC.

Some interesting compilations have just been made by the Customs authorities in New York about the distribution of passengers by the various ocean steamship lines. The returns show the number of passengers carried by each of these across the North Atlantic, and have a direct interest, in view of the fact that the belief is expressed in many quarters that the Shipping Trust will, in the future, make an effort to control passenger traffic. This,

of course, will be more difficult than in the case of freight, which, it is expected, will be managed in some way through the railroads which convey it to the coast. According to the common belief an attempt will be made to have this traffic divided, if possible, upon a *pro rata* basis, so that each ship within the combination will have its share. This will be done for the purpose of preventing the fast, popular ships, known as "flyers," from sailing with great crowds, while the smaller and slower steamships must make the voyage with a meagre passenger list. It is believed that in order to promote this the sailings will be so arranged that only one fast ship shall leave New York each week. In this way it is thought that competition would be reduced to the *minimum*. In connection with this, the following tabulated statement, showing the number of outgoing passengers carried by each of the lines for the year ended June 30, 1901, will of itself show some of the difficulties which the new combination is likely to encounter:—

SHIPPING TRUST.			
	Cabin.	Total.	
American Line	9,252	16,083	
Atlantic Transport	4,197	4,197	
Red Star Line	4,435	14,625	
White Star Line	14,160	28,833	
	32,044	64,738	
GERMAN AND ALLIED LINES.			
Hamburg-American	18,470	34,058	
Holland-American	4,913	11,704	
North German Lloyd	14,887	32,770	
	38,270	78,532	
OUTSIDE LINES.			
Allan-State	1,425	1,764	
Anchor	5,417	3,141	
Cunard	15,534	26,786	
French Line	7,943	24,579	
Wilson	112	112	
	30,431	61,382	
Totals	100,745	204,652	

It is estimated that, when the returns for the last complete year, ended June 30, 1902, are compiled, at least one of the lines in the trust will show a considerable decline in the outward-bound passenger traffic. It is interesting also to note that the two German lines carried more passengers in the year under review than all of the lines in the combination, and also more than what may now be termed the independent, or outside, lines.—*Times*.

THE EXPANSION OF CANADIAN TRADE.

The High Commissioner for Canada, Lord Strathcona, has issued a statement, in which he draws attention to the rapid increase during the past two years of the trade between Canada and Great Britain.

It is generally well known that, for some years past, the exports of the produce of the Dominion to the mother-country have been rapidly increasing. The following figures (the Canadian fiscal year ends on June 30) bearing on that part of the question speak for themselves:—

	Total Canadian Exports.	Exports to Great Britain.
	Dols.	Dols.
1902	196,019,000	109,348,000
1901	177,431,000	92,857,000
1899	138,462,000	85,114,000
1897	123,959,000	69,533,000
1895	103,085,000	57,903,000
1890	85,257,000	41,499,000

The exports consist largely of horses, live cattle, meats of all kinds, general farm and dairy produce, and fruits. Other considerable items in the trade are the products of the mine, the forest, the fisheries, and the manufactories of the different provinces.

Prior to 1896, the imports from Great Britain, of its staple manufactures, were decreasing, but owing to the influence of the preferential tariff, abundant harvests, and increased immigration, the trade has since been advancing, as shown by the following figures:—

	Total Canadian Imports.	Imports from Great Britain.
	Dols.	Dols.
1902	202,791,000	49,215,000
1901	181,237,000	43,018,000
1899	154,051,000	37,060,000
1897	111,294,000	29,412,000
1890	112,765,000	43,390,000

There is plenty of room for the expansion of Canadian exports to Great Britain, and of British exports to Canada. Canadians believe that, all other things being equal, there is a disposition in the United Kingdom to look favourably on the products of the Canadian farms, dairies, and orchards—such as wheat, oats, flour, butter, cheese, eggs, bacon, ham and other meats, canned goods of all kinds and fruits; and also on the other natural products and manufactures to which reference has been made. The trade might be much increased if consumers would enquire for Canadian products among the many kinds that are imported.

Lord Strathcona says that the Canadian Government is anxious to facilitate as much as possible communication between British exporters and Canadian importers, and Canadian exporters and British importers, and that correspondence is invited in his department from merchants and importers who are interested. Statistics and other information relating to the different branches of Canadian trade—both imports and exports—are available, and the various trade journals, daily, and weekly papers, official reports and business directories, may be inspected at any time at the Canadian Government Offices, 17, Victoria-street, S.W.

FOREIGN TRADE OF THE UNITED KINGDOM.

The trade and navigation returns for the month of October, 1902, make a fair comparison with the corresponding period of last year. The increases reported both under imports and exports are accordingly very satisfactory.

Taking the imports first, these show an expansion of $2\frac{1}{2}$ millions, or 5.6 per cent., as compared with last year, but are still rather over $1\frac{1}{2}$ millions, or 3.4 per cent., less than was recorded for the 1900 period. Comparing October this year with the corresponding

month last year, the largest increase is under the head of raw textile materials, which are £1,364,000 higher, as a result of greatly increased cotton shipments, no fewer than 532,000 cwt. additional having been imported, chiefly from the United States, though the arrivals from Egypt were also larger.

Manufactured articles give £592,000 increase, principally under the heads of cotton, silk, and wool; but the items are well distributed, and not of much importance separately, though motor cars figure for £103,000 extra. Dutiable articles of food and drink increased by £567,000, shipments of wheat being over $2\frac{1}{2}$ million hundredweights greater in bulk and £964,000 in value. A feature in this connection is the very large stride made in the imports from Russia. In October last year only 117,500 cwt. valued at £36,000, were exported thence to Great Britain, while now the quantity is no less than 1,638,812 cwt., of £531,000 value, which proves how quickly the wheat districts of Russia have recovered from the severe effects of the drought experienced last year.

United States and Canadian shipments were also larger. Maize shows a falling off of £136,000, the reduction being from the United States. Sundry raw materials give £316,000 gain, sawn and split timber coming to hand more freely and showing £601,000 increase—principally from Sweden, Canada and the United States. Imports of gutta-percha are £97,000 less. Tobacco—mostly unmanufactured—increased by £160,000, and duty free articles of food and drink were £165,000 higher. Fruit shipments continue to expand—especially as regards apples—and hops, owing to the disastrous season here, had to be imported to the extent of £170,000 extra. Beef fell off by £159,000—chiefly from the United States—though exports from the Argentine were again greater, and bacon by £130,000—also from the United States. Imports of metals were £250,000 less—mostly in copper from Spain—and live stock decreased by £178,000, the decline being in United States exports. Miscellaneous articles were £339,000 less than a year ago—largely in flax from the British East Indies.

As regards exports of British produce there is an increase of £1,166,195 to note over the 1901 figures, or 4.9 per cent., and of £401,901, as compared with 1900, or 1.6 per cent. The largest gain is reported under the head of metals and their manufactures, the amount being £577,392 larger. Iron, both wrought and unwrought, gives £377,000 extra, large additional shipments of pig iron being made to the United States. The large increase of £319,000 is shown under telegraphic wires and apparatus, but no destination is given. Copper declined £133,000, as was only to be expected in the face of the diminished imports. Articles of food and drink increased by £241,000, principally from the export of herrings. Raw materials show £199,000 increase. Exports of coal were 445,265 tons greater, and brought in £136,000 more. Articles of apparel and personal use were exported to the increased value of £170,000, but there was a decrease of £82,000 in the price of the new shipments exported. Chemical shipments were £38,000 larger.

BRITISH MINES AND QUARRIES.

Part III. (output) of the General Report and Statistics of Mines and Quarries for 1901 has been published as a blue-book. It relates to the output and value of the minerals raised in the United Kingdom, the amount and value of the metals produced, and the exports and imports of minerals during the year mentioned. Dr. C. Le Neve Foster, in his introduction, remarks that the record of the first year of the century is not a favourable one.

Of the numerous minerals raised in the United Kingdom coal is the only one of overwhelming importance; in 1901 its value represented 88.8 per cent. of the total value of our mineral output.

Compared with the figures for the previous year, the statistics show a drop of more than six million tons in our output of coal, the first interruption in the steady rise since the great strike of 1893, if we except the trifling diminution which occurred in 1898. Turning to the figures for the four separate divisions of the United Kingdom, it appears that the diminution in output was felt especially in England, and to a much smaller extent in Scotland, whereas in Wales there was a slight increase. Expressed in percentages the decrease in the output of England was 3.68, that of Scotland .95. and the increase in Wales .21.

The demand for coal was less than in 1900; owing to slackness in the iron trade the consumption of coal in the blast furnaces was smaller by $2\frac{1}{2}$ million tons, and at the same time the exports fell off by nearly $2\frac{1}{2}$ million tons. The average price per ton of coal was 1s. 5d. less than in the previous year, so that the reduced consumption cannot be ascribed to higher cost.

The oil-shale mines of Scotland yield a product of greater money importance than the tin mines of Cornwall. With tin ore an increased production is chronicled; but, owing to diminished prices, the value of the output in 1901 was less than that of the previous year. The quantity of zinc ore represents pretty nearly the average of the last decade, but here again the mine-owner received less money for his produce.

As regards iron ore Dr. Le Neve Foster says:—Next in importance to coal is iron ore, though the gap between these two minerals, whether as regards quantity or value, is a very wide one. The output of iron ore which was rising from 1893 to 1899 has since been falling, and the diminution of $1\frac{1}{4}$ million tons in 1901 represents $12\frac{1}{2}$ per cent. of the quantity raised in the previous year. The imports likewise were smaller; the falling off was nearly three-quarters of a million tons, or 12 per cent. After Spain, Greece is our largest provider of foreign iron ore.

Of other metallic ores there is little to be said. The report notes that natural gas is being obtained in Sussex, and that much is hoped from the discovery.

NITRATE DEPOSITS IN CALIFORNIA.

Considerable interest has been aroused in America by the explorations which have been made during the last few years into the nitrate fields situated in Bernardino and Inyo counties, in the State of California. These are found along the shore lines, or former beaches, that marked the boundary of the former lake, now dry, known as Death Valley. The nitre is found in the huge clay hills surrounding this valley. An analysis of specimens of this strata show that some of them carry a percentage of from 15 to 40 per cent. of nitre, thus proving that they rival the well-known beds of Chili in richness. The lands already prospected and taken up by companies comprise about 35,000 acres, and it is estimated that the surface caliche, which is the name given to the nitre-bearing strata, has in sight something like 22,000,000 tons. Some of these strata below the surface are said to range from 3 feet to 10 feet in thickness. The interest of these new deposits has not been limited to investors, or to chemists and geologists and other scientists, but there has also been a movement among miners and others to this distant and desolate territory. Thus far, this is accompanied by a good many difficulties, because of the remoteness and necessary expense connected with its exploration. It is impossible to make a visit to it, even for a few days, without a large and expensive outfit of bedding, tents, and food for both men and animals. There are, too, no cabins where supplies can be stored, so that it is difficult to carry and keep a stock for more than a month's stay. With a little further development, it is expected that tents will be supplied, to be followed by more permanent

buildings, in which the explorers can carry on their chemical work with better results. The report made by the California State Mining Bureau has not accurately defined either the extent of the territory in which these deposits are found, or of the deposits themselves, but enough is known to suggest many points of similarity between these nitre beds and those of Chile. Both are situated in typical hot, rainless deserts, and have evidently, it is asserted, been formed under the same geological conditions and upon the same huge scale. This discovery, if verified, will certainly be of great interest to the commercial world. The great supply of this product is now drawn from the province of Tarapaca in Chile. The control of the Chilean beds is in the hands of English companies, which have made a very strong combination. If the new deposits in California turn out as expected, a great development of the nitrate industry in its various forms may be looked for in the United States, and there will probably be some interference with the plans of the existing combination.

NEW BOOKS, etc.

CH. DELAGRAVE. (Paris, 1902.)

L'Avenir Colonial de la France (Colonisation Française et Étrangère). Par E. FALLOT, avec une préface de René Millet, Ambassadeur. Ouvrage accompagné de 12 cartes en couleur. 8vo., pp. 550. (Prix, 5 fr.)

This book is a manual of colonial questions, and includes a critical study of the principles on which all work of colonisation depends; the part taken by the State in promoting the immigration of men and capital; colonial credit, commerce and Customs tariffs, and the political and administrative organisation of the French colonies. There is also given a comparative study of the colonisation and the colonial methods of the different colonising nations, together with a geographical, political and economic account of each of the French colonies, old and new, and of their present condition and prospects. France is now the second colonial power in the world, ranking next to England, and her colonial expansion has taken place within the last twenty years. This has quite changed the attitude of France towards her foreign possessions, and much attention is now given to colonial questions. M. Fallot's book is the outcome of his lectures given at the technical school, recently founded at Tunis, for the training of intending colonists, and deals with these questions in a lucid and interesting manner. In a chapter on the English colonies, he contrasts the colonial systems of France and England; and shows clearly that the enormous growth of our Empire beyond the seas is due to the ability of Englishmen to profit by fortunate circumstances, and above all to the perseverance and methodical spirit they brought to bear on policy as well as administration. He says—"In all the English colonies we find the same anxious care to avoid changing as little as possible the legislation consecrated by long usage, and thus at Malta the code promulgated by England, after very slight modifications, is that of de Rohan, the work of one of the last Grand Masters of the Order of Malta; so also the French laws have remained in force in Mauritius and in Lower Canada, and the Dutch laws in British Guiana, since these colonies have passed under the English rule. A consequence of this system is that colonial questions are very rarely submitted to Parliamentary discussion, only questions of a very general interest are considered as being within its purview. This system is the inverse of that of France, in which laws and regulations are made solely in Paris, often by persons who have only a very imperfect knowledge of the colonies, and despatched to the Governor with orders to have them put in force." M. Fallot has given an excellent account of the many varieties of the British colonial system, as well as of those of other countries. In a concluding chapter he deals with the future of the French colonial possessions, and shows the necessity of a complete change in the uniformity which the French Government has imposed on all its colonies, irrespective of their social and economic conditions. With the great expansion of her colonial empire, the interests of France have been widely extended, and it has become important that the French youths who may be destined to a colonial career should have some special preparation beforehand. M. Fallot's book provides an admirable source of information of the greatest value to all interested in the colonies and colonial questions.

LA SOCIÉTÉ DE GÉOGRAPHIE COMMERCIALE. (Paris, 1902.)

L'Inde Française au dix-huitième siècle. Ouvrage posthume de HENRI CASTONNET DES FOSSES. Avec portrait de l'Auteur. 8vo., pp. 558. (Prix, 3f. 50c.)

The author of this volume was for twenty years a member of the "Société de Géographie Commerciale" of Paris, to which he rendered great services, as well as to the colonial cause and to French expansion both in the colonies and abroad. For eleven years he directed various sections of the society, and was for two years its vice-president. He devoted much of his time and attention to questions of economic and historical geography and of colonisation. He has written a great deal on these subjects, which appear to have had great attractions for him. The account he has given of the rise and decline of French power in India during the eighteenth century is most interesting, and the rivalry between the French and English is related in a very impartial manner. The career of the celebrated Dupleix, down to his fall, is well described. The book will be read with much pleasure, and will well repay perusal.

CASSELL AND COMPANY, LIMITED. (London, 1902.)

"Britain at Work," a pictorial description of our National Industries. Illustrated from photographs, etc. Sm. 4to., pp. viii. + 384.

This handsome volume contains a brief and well-written description of the many industries and manufactures of the United Kingdom, and the methods by which they are carried on, commencing with the building of a battleship, which is contributed by Mr. H. W. Wilson. It is remarkable how few persons beyond those immediately concerned with them, possess any definite knowledge of the way in which the commonest articles in daily use, such as soap, paper, matches, etc., are made. This book gives a succinct and lucid explanation of the manner in which each industry is conducted, and the various processes of manufacture. Every aspect of industrial life is described, and the articles are contributed by experts in each department, so as to ensure an accurate and instructive account. The most valuable portions of the work, however, are the numerous photographic illustrations which are executed in the admirable style for which the publishers, Messrs. Cassell and Co., are so justly celebrated. The book is well bound and printed on fine toned paper, and should be a desirable and useful acquisition to any library.

SAMPSON LOW, MARSTON, AND COMPANY, LIMITED. (London, 1902.)

The Guide to South Africa; for the use of Tourists, Sportsmen, Invalids, and Settlers. With coloured maps, plans, and diagrams. Edited annually by A. SAMLER BROWN and G. GORDON BROWN. 1902-1903. Tenth Edition. 8vo., pp. lx. + 474. (Price 2s. 6d.)

The changes that have taken place and that are taking place in South Africa, as the result of the late war, have necessitated a considerable revision of this useful book, especially with regard to the information concerning the methods of acquiring land, the mining and game laws, state-aid to emigration, etc., which are not yet definitely settled. Statistics of trade have been carefully reviewed, but the latest figures, when abnormally affected by passing circumstances, have not always been inserted. In the preface, the editors say that: "Comparison between times of peace and times of war are more likely to mislead the reader than to serve the purpose for which statistics have been included in this work." For tourists in South Africa the book will be found invaluable, as minute directions are given respecting all the possible routes that can be taken. As there will probably be a large influx of people into this part of the world, no better guide can be found than this well-compiled handbook. The information is given in a compact and handy form for reference, and the book is printed on thin paper, so as to occupy but little space. The excellent maps and diagrams which have been specially prepared for this Guide, will be found of great service.

JNO. N. LIGHTBOURN'S SONS. (St. Thomas, West Indies.)

West India; a bi-monthly magazine devoted to the social and economic questions of the West Indies. August, 1902. 8vo., pp. 32. Illustrated.

This is a new publication, and one that will prove of great service in furthering the interests of the West Indian Islands. There has been a great want of information of a useful character with regard to these islands, which has been the main cause of their being comparatively neglected. The contents of the first number of this magazine are varied and attractive, and the illustrations, which are all from photographs, are above the average; they add much to the interest of the publication, which deserves to be successful. It will be useful, not only to the West Indian people, but also to those in the United Kingdom who may contemplate a tour in these beautiful islands.

CHARLES GRIFFIN AND COMPANY, LTD. (London, 1902.)

Year-Book of the Scientific and Learned Societies of Great Britain and Ireland, 1901-1902. Compiled from official sources. Nineteenth Annual Issue. 8vo., pp. 211. (Price 7s. 6d.)

This volume contains the lists of papers read before the various Societies during the session which, with comparatively few exceptions, commenced in October, 1901, and ended in June, 1902. In most instances these lists have been contributed directly by the Societies. It offers a concise review of the history, organisation and conditions of membership of the Scientific and Learned Societies of Great Britain and Ireland, and is invaluable to scientific workers, as it records the different subjects that have occupied attention during the past lecture season.

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MONTHLY COMMERCIAL AND INDUSTRIAL SUMMARIES.

GENERAL COMMERCE AND INDUSTRY. COLONIES.

Cape Colony.—IMPORT AND EXPORT TRADE.—The Cape imports for the nine months ended September amounted to £22,414,886 (including specie £2,010,465), against £15,141,743 (including specie £2,523,568) for the corresponding period last year. The exports were £10,956,416 (including specie £100,040), against £8,478,929 (including specie £153,049). The exports also included gold of the value of £3,542,070, against £1,119,320 last year.

Ceylon.—EXPORTS AND IMPORTS.—The report by the Colonial Secretary for Ceylon, shows that there has been a decline in the imports and exports for the past year. The value of the former, exclusive of specie, amounted to Rs.104,050,000, as against Rs.114,544,000 for the previous twelve months, while that of the exports was Rs.100,182,000, or nearly Rs.6,000,000 less than for the corresponding period. The exports of Ceylon produce were Rs.85,977,000, a decrease of Rs.4,891,000, which is mainly attributed to the smaller shipments of tea, the valuation of which also declined from 36 cents a pound to 33 cents in the year under review. Exports to the United Kingdom fell from Rs.56,295,500 in 1900, to Rs.50,158,700, but shipments to British colonies rose from Rs.18,086,700 in 1900 to Rs.18,995,000, and those to foreign countries from Rs.20,580,000 to Rs.20,775,700.

TEA.—The export of tea, the report says, seems at last to be reaching its maximum, and shows a slight decrease on the figures of 1900, the quantity exported being 145,188,200 lb., as compared with 148,431,600 lb. Part of the decrease is, however, made up by the export of 1,110,774 lb. of green tea, most of which went to America. The export to Russia and Australia has increased, that of black tea to America decreased, but the decrease is more than made up by the green tea. The average price is the lowest as yet recorded, 6.86d. against 7.20d. in 1900, but towards the end of the year prices considerably improved. The industry has not suffered from any very serious outbreaks of disease, and planting has not extended.

INDIARUBBER.—It appears that the cultivation of india-rubber continues to extend in suitable districts in the island, and samples prepared from several estates have obtained very good prices on the home market, considerably higher, in fact, than those realised by the best South American rubber. The export of this commodity is now going steadily on, 66 cwt. having been shipped last year. The plumbago industry, on the other hand, has been suffering from depression during the year, and the number of mines working in the north-west province fell from 50 to 23. This is due to the low prices prevailing, which rendered the production of all but the highest class of plumbago unremunerative. It is believed, however, that the introduction of improved plant would enable many of the mines now idle to be worked at a profit, and in some cases steam pumps have already been used with good results.

Farming in Jamaica.—Sir Allred Jones has written with reference to the possibilities of Jamaica, to insist on what he thinks would be an immense advantage to young Englishmen—namely, to go to Jamaica. When he was there he was struck with the great opportunities for young British farmers, as many of the fine old estates can be obtained for very little money. The prospects are very great. For instance, there is fruit-growing, and there is a possibility of the sugar industry returning. There is, moreover, a very fair prospect of these estates being made profitable for cattle-raising and horse-breeding. Messrs. Elder, Dempster & Co. have offered to carry pedigree stock freight free, and if any young British farmer would care to go out, say for 12 months, to learn farming, there would be every probability of success, provided he had the means of purchasing a farm at the end of the year for, say, £5,000. Sir A. L. Jones states that he has seen several such estates which have given a return of 20 per cent. merely out of cattle- and horse-breeding. There are many farms where pupils can live for 35s. or £2 a week. It is no use a man going out to any place unless he understands what he has got to do. The climate is delightful, and the life is exceedingly pleasant. Now is the time for the young British farmer to go to Jamaica and capture estates at very low rates. He says that if there is any information he can give anybody on the points raised, he will be only too pleased.

Irrigation in South Africa.—Regarding the prospects of irrigation, *The Engineer* reports that nothing on a large scale is being done in the matter at present, or is likely to be done in the immediate future. There is a scheme before the Cape Colonial Government involving an estimated outlay of less than £200,000. It is doomed in advance to fall through, not on its merits, but for political reasons only. The Government have not been successful in the small amount of irrigation work that they have done so far, and in Parliament it is argued that if they were unsuccessful before, they must assuredly be so again. Suffice it to say here that the Government for the moment will not take up this matter, and that the laws of this country relating to diverting your neighbours' water supply are so complex and stringent that, except in a few special instances, it is impossible for a private individual or company to undertake such work. Undoubtedly there is scope for really efficient dam engineers here, and the Government are talking of appointing a special permanent hydraulic engineer.

Machinery in New Zealand.—Messrs. G. H. Grapes and Co., horticultural merchants of Paraparaumu, Wellington, New Zealand, write to be placed in touch with manufacturers of wood-working machinery for fruit cases and boxes for packing glass, especially those making a suitable description of reciprocating three-bladed gang-saw machines; also with makers of the apparatus necessary for the equipment of a small fruit-preserving plant (suitable for turning out 1,000 to 10,000 two-pound glass jars of jam per diem), and for jelly making and fruit bottling; also with makers of first-class fruit-grading machinery on the automatic principle—the above to be worked by a 12-horse-power engine.

Prospects in Manitoba.—An interesting statement in regard to the possibilities of Manitoba has just been prepared by Mr. McKellar, the Deputy Minister of Agriculture for that province. He places the total area of Manitoba, Assiniboia, Saskatchewan and Alberta at 230,823,000 acres, and, deducting forests, mountains, swamps, arid districts and road allowances, he estimates the amount of desirable farm land as follows:—

	Acres.
Manitoba	23,000,000
Assiniboia	19,000,000
Saskatchewan	17,000,000
Alberta	16,000,000
Total	75,000,000

Of this 75,000,000 acres it is estimated that 20,000,000 in Manitoba and 10,000,000 in the Territories have already passed out of the hands of the Dominion Government and the railway companies, as homesteads or by sale. This leaves 45,000,000 acres of farming lands yet to be disposed of. In the year ending

30th June last, 2,373,120 acres were homesteads, while there were sold of railway lands in the same period approximately 2,126,880 acres, or a total of 4,500,000 acres. Mr. McKellar points out that the possibilities of production have been barely touched. Of the 23,000,000 acres of farm lands in Manitoba, for instance, only 3,189,015 acres are under crop this year, and, say, 500,000 acres summer-fallowed, making in all 3,689,015 acres broken. "Within the next ten years we may expect at least 10,000,000 acres to be under cultivation," says Mr. McKellar. "Computing the increased acreage in ten years by last year's acreage in crop, Manitoba will then be producing in one year 168,340,280 bushels of wheat, 92,655,290 bushels of oats, 21,787,180 bushels of barley, and in all grains 283,932,860 bushels." Assuming a similar increase in acreage in the Territories, and making allowance for varying local conditions, it is computed that the crop in Manitoba and the Territories ten years from now will be 350,000,000 bushels of wheat, 200,000,000 bushels of oats, and 50,000,000 bushels of barley. This estimate is on a basis which will mean the cropping of only a little over 20,000,000 of the 75,000,000 acres, or 43 acres out of every 160, so that when the full possibilities of that vast area are achieved, and the crop area will be more like three times that number of acres, the grain production would be over 1,000,000,000 bushels of wheat, 600,000,000 bushels of oats, and 150,000,000 bushels of barley. That would still leave 14,000,000 of the 75,000,000 acres unbroken for pasture or hay, and takes no account of the remaining areas, at least 100,000,000 acres in extent, of swamp land, forest, arid belts, etc., much of which will be, as it at present is, found useful for grazing purposes.

In the event of Mr. McKellar's estimate of the grain production ten years hence being realised, it is claimed that there will be available for export 300,000,000 bushels of wheat, and 100,000,000 bushels of oats, which would require for its transport a train as long as from Vancouver to Montreal.

Queensland.—THE NEW LAND BILL.—The measure introduced into the Queensland Parliament for the relief of the pastoral tenants of the Crown has met with fairly general approval. The extensions in the settled districts of Darling Downs and Burnett have a minimum of ten years, while elsewhere, throughout the whole State, twenty-one years has been added to the existing term of leases, with a general maximum of forty-two years. The Bill retains the power to resume a fourth of the area under the existing leases, but this power lapses if it be not exercised before the existing lease expires. Power has also been taken to resume another fourth during the currency of the extended lease, but the holding is irreducible below forty thousand acres, unless the Court considers that public interest requires it. The lessees are allowed to select one of their holdings during currency, and to retain priority at the end of the extended lease, as in the Act of 1901. A lessee coming under the new Act surrenders his present lease and also the right of compensation for improvements under the Acts of 1884 and 1886. The sections dealing with grazing farms provide that the present holders shall have the right to purchase freeholds at the minimum price of 10s. an acre, payment extending over a period of nineteen years.—*Reuter*.

West Indies and West Africa.—The West India Committee states that Mr. Chamberlain has transmitted, for the information of the committee, a despatch from the Governor of Barbados on the subject of the establishment of a trade in sugar, rum and molasses between the West Indies and West Africa. Mr. Chamberlain is addressing a despatch on the subject to the Governors of the Gold Coast, Lagos, Sierra Leone, and the Gambia, and to the High Commissioners of Northern and Southern Nigeria, as desired by Sir F. Hodgson, but not to the Governor of Natal, Natal being itself a sugar-producing colony. The following is the text of Sir Frederic Hodgson's despatch:—"Government-house, Sept. 2, 1902. Sir,—I have the honour to inform you that in May last I received a letter from a Mr. Alfred Isaacs, a merchant doing business in St. Louis, Senegal, suggesting the shipment of sugar to West Africa, where, he said, it would find a ready market. From my knowledge of the country and of the people, I believe that it would, if it could be shipped in packages suitable for the purposes of sale. The matter has been under the consideration of the Barbados Agricultural Society, and, as the outcome of their deliberations, it has been decided to make up samples of sugar, molasses and rum made in Barbados, and to transmit them to the Governors of Natal, the Gold Coast, Lagos, and Sierra Leone, the High Commissioners of Northern and Southern Nigeria, and the Administrator of the Gambia. If you concur, I beg leave to ask that you will do me the favour of sending a circular despatch to the Governors and High Commissioners of the colonies in question, requesting them to submit the samples to the chambers of commerce, or, in the absence of such chambers, to the principal merchants, and that the following information be obtained, namely:—(a) Whether there is likely to be a demand for any of the articles represented by the samples sent, and, if so, what would be the probable quantities; (b) in the event of there being the likelihood of a demand, what merchants will undertake to receive shipments; (c) in what kind of packages the articles should be shipped and the weight of each package; (d) whether it would be possible to obtain from each person willing to buy any of the articles a *pro forma* sale for, say, ten tons of sugar and 100 gallons of molasses or rum; (e) what is the rate of exchange between each colony and protectorate and England. It would, I think, be very useful to create a new market for sugar in West Africa, and I shall be glad to learn that you will assist the Government of Barbados in this matter. I propose, with your consent, that the samples, properly packed and addressed, be sent to the Crown Agents for the Colonies for shipment to each colony. I have, etc.—(Signed) F. M. HODGSON."

FOREIGN COUNTRIES.

France.—IMPORT AND EXPORT TRADE.—According to the official report of the French Government the value of imports into that country between January 1 and September 30 last amounted to 3,269,221,000 francs, as against 3,268,515,000 francs for the same period of the year previous, while the total exports were 3,099,771,000 francs, as against 2,948,451,000 francs the preceding year. The total imports between January 1 and September 30 last were, therefore, greater than the total exports by 169,456,000 francs. These figures for the nine months of 1902, compared with the nine months of 1901, are divided as follows:—

	Francs.	
IMPORTS.	1902.	1901.
Foods and foodstuffs	565,783,000	559,799,000
Industrial materials	2,130,707,000	2,134,393,000
Manufactures	572,731,000	574,323,000
Totals	3,269,221,000	3,268,515,000
EXPORTS.	1902.	1901.
Foods and foodstuffs	500,132,000	526,279,000
Industrial materials	857,881,000	744,161,000
Manufactures	1,568,505,000	1,512,213,000
Postal packages	173,253,000	165,798,000
Totals	3,099,771,000	2,948,451,000

Importations of manufactures show a decrease of 1,792,000 francs, indicating that domestic industries have been able to struggle more successfully with outside competition. The decrease in foods and foodstuffs is more than made up for by the increases in industrial materials and manufactures, as well as by the increase in postage packages, an important item, being composed largely of manufactured objects.

The trade returns for October have also been issued. With the exception of the imports of raw materials, which amounted to 123,000,000 francs, against 124,000,000 francs in the corresponding month of last year, they show increases. The exports of raw materials are set down at 102,000,000 francs, against 92,000,000 francs. The exports of manufactured goods amounted to 181,000,000 francs, against 173,000,000 francs. The parcel post exports were of the value of 19,000,000 francs, against 17,000,000 francs. The imports of manufactured goods amounted to 65,000,000 francs, showing a slight increase of about 130,000 francs.

Germany.—FOREIGN TRADE RETURNS.—The complete returns regarding the foreign trade of Germany for the year 1901 have now been made public by the Imperial Statistical Office. From 1897 to 1900 the exports of Germany, like those of the United States during the same period, steadily increased. Imports also made marked gains, though the total increase was not so great as in the case of exports. Then came a sudden period of decline, both exports and imports for 1901 falling considerably below the corresponding totals for the preceding year. The following table shows the exports and imports of Germany by continents for 1900 and 1901, and the increase or decrease in each case:—

From	EXPORTS.		Increase or Decrease.
	1901.	1900.	
Europe	\$932,910,534	\$977,867,578	— \$44,957,044
America	155,167,893	173,106,611	— 17,938,718
Africa	17,956,728	19,861,660	— 1,904,932
Asia	51,940,521	57,189,564	— 5,249,043
Australasia	13,769,595	12,577,078	+ 1,192,517
	\$1,171,745,271	\$1,240,602,491	— \$68,858,220

From	IMPORTS.		Increase or Decrease.
	1901.	1900.	
Europe	\$884,592,116	\$984,622,900	— \$100,030,784
America	420,293,396	414,868,554	+ 5,424,842
Africa	30,768,343	35,769,843	— 5,001,500
Asia	95,465,350	89,957,269	+ 5,508,081
Australasia	27,813,780	30,770,361	— 2,956,581
	\$1,458,932,985	\$1,555,988,927	— \$97,055,942

LABOUR MARKET.

UNITED KINGDOM.

Employment Changes.—According to the *Labour Gazette* the general state of employment in October showed no appreciable change as compared with the previous month, but it continued to be decidedly worse than a year ago, and was below the average for the month of October in the last ten years. In the 223 trade unions, with an aggregate membership of 548,442, making returns, 27,270 (or 5.0 per cent.) were reported as unemployed at the end of October, as compared with 3.7 per cent. in the 216 unions, with a membership of 544,827, from which returns were received in October, 1901. The mean percentage of unemployed returned at the end of October during the ten years 1892-1901 was 4.7.

TRADE DISPUTES.

Twenty-three fresh trade disputes began in October, involving 12,229 workpeople, of whom 10,423 were directly, and 1,806 indirectly affected; the corresponding number of disputes in September was 18, affecting 6,864 workpeople, and in October, 1901, 26, affecting 10,501 workpeople. Of the 23 new disputes in October, 1902, 2 took place in the building trades, 7 in the mining industry, 7 in metal, engineering and shipbuilding trades, 5 in textile trades, and 2 in other trades. Of the 27 new and old disputes affecting 9,386 workpeople, of which definite results were reported, 5, involving 3,220 persons, were decided in favour of the workpeople, 14, involving 3,440 persons, in favour of the employers, and 8, involving 2,698 persons, were compromised.

CHANGES IN WAGES.

The changes in rates of wages reported during October affected 47,950 workpeople, of whom 20,280 received advances, and 27,670 sustained decreases. The net effect of all the changes was a decrease averaging 6d. weekly per head of those affected. The changes of the previous month affected 135,000 workpeople, the net result being a decrease averaging 9½d. weekly per head.

During October, 1901, the number affected was 17,700, and the net weekly result was an increase averaging 3½d. weekly per head.

The principal advances reported were those affecting 5,500 coal miners in the Forest of Dean, 6,400 ironstone miners and 5,500 blast-furnacemen in Cleveland. The principal decreases affected about 27,400 workpeople engaged in the shipbuilding industry on the North-East Coast.

COLONIES.

Canada.—The last monthly report of the Canadian Department of Labour shows that skilled mechanics had been very busily employed in the building and other trades, that lumbermen had been very busy and good hands were scarce, and that owing to the good harvests, both in the east and the north-west, farm labourers and harvesters had been in great demand. It is too late in the season, however, for anyone other than female servants to emigrate this year to Canada, unless he goes to friends, or has enough means of his own to keep him while work is slack in winter. A good many coal miners in British Columbia are out of work, but in Nova Scotia there is a demand for skilled men.

Australia (New South Wales).—No one is recommended to emigrate to New South Wales at the present time unless he is a skilled plumber, or has means of his own, or has secured employment. Large numbers of miners (except coal miners), pastoralists and others are out of work owing to the severity of the drought, which has now lasted over six years, and it will be scarcely possible to provide work for all of these on either the reproductive or relief works initiated by the Government. The only opening at the present time is for female labour, either in domestic service or in boot and shoe and clothing factories. The annual report on the Metropolitan and Newcastle factories for 1901 shows that the number of registered factories increased from 2,047 in 1900 to 2,195 in 1901, and the number of employees from 39,104 to 42,273. The principal increases were in the meat-preserving, jam and fruit canning, bacon-curing, shirt-making, and glass bottle-making factories. The building trades and engineering shops were well employed during the year; more than half the

furniture makers were Chinese; the wages of tailoresses improved. A dispute has arisen between the shipwrights and joiners in the shipbuilding trade which may lead to trouble. The shearers have abated their demand, and now claim that their wages should be increased from 20s. per 100 to 22s. 6d. instead of 25s. as previously asked; the dispute is still unsettled. (Victoria).—With the exception of Gippsland and the West, which are a little better off, the State is suffering severely from the drought, and emigrants without means are advised not to go there at present. The pay of railway employees, receiving £150 per year and over, has been reduced. Special Boards appointed under the Factories Acts, have fixed the lowest wages payable to persons manufacturing wicker goods at 1s. an hour; to compositors and stereotypers at 1s. 0½d. to 1s. 1d. an hour, to persons engaged on linotype or monoline work at 1s. 6d. to 1s. 8d. an hour, and to lithographers and bookbinders at 1s. 1d. an hour; to males above 16 years old making boots and shoes at 6s. 8d. to 7s. 6d. per day of 8 hours, and to females with four years' experience at 20s. per week of 48 hours; to male blacksmiths in the bedstead trade at 42s. per week of 48 hours, and to female polishers of japanned work at 22s. 6d. per week of 45 hours; to wool scourers in the woollen trade at 30s. a week, and to female warpers (first year) 15s. a week; and to persons making bottle or flue brushes at 48s. a week. (South Australia).—The drought has been severe, and there is no demand whatever for more labour; but good rains have just fallen in the agricultural districts, which should improve matters. (Queensland).—The long drought is causing great losses in Queensland, and there is no demand for more labour, except for a few farm labourers in the south, and for female servants in most parts. (Western Australia).—There is a good demand for farm labourers and female servants, but the supply of mechanics and miners is sufficient. The dispute between the miners and mine-owners at Kalgoorlie has been settled by the Arbitration Court—rock drill men are to receive 13s. 4d. to 14s. 4d. per shift (8 hours), and miners 11s. 8d. (New Zealand).—During the last few weeks work has been rather slack, as is usual during the winter season. For those emigrating now the prospects are good. In Taranaki the dairying industry is very prosperous, and dairy factories are increasing. Competent men have no difficulty in getting work on the land; the building and other trades have also been doing well, and building plots are sought for, and sell at advanced prices.

South Africa.—Permits to land are not required now in Cape Colony or Natal, but are still required by those proceeding to the Transvaal and Orange River Colony. There is no demand whatever anywhere for general labourers. Owing to the large numbers who have recently arrived, there is no special demand for mechanics anywhere; but really skilled mechanics—especially those in the building trades—have a very fair chance of work if they can afford to keep themselves some little time while searching for it. They must remember that the cost of living is high in all parts, and in the Transvaal from two to three times as high as it is in England. A few experienced platelayers and carriage and wagon examiners are wanted for the Natal Railways; application should be made to the Agent-General for Natal, 26, Victoria-street, London, S.W. There is a good demand for female domestic servants, but they should not go alone unless they go to friends, as they will find suitable lodgings very expensive and difficult to obtain, and will incur other risks. Advanced passages to the Transvaal may be obtained by female servants in special cases on application to the South African Expansion Committee, Imperial Institute, London, S.W. Single men who can ride are wanted for the South African Constabulary. They should apply at the Recruiting Office in King's-court, Broadway, Westminster, S.W. — *Report of the Emigrants' Information Office.*

FOREIGN COUNTRIES.

Retail Price Statistics.—In a report recently issued the Massachusetts Bureau of Labour Statistics presents the results of an investigation into the direct cost of living to working men at present as compared with earlier times. The dates selected are 1872, 1881, 1897 and the present year. The figures upon which the report is based cover retail prices in the different cities and towns in the State in which considerable numbers of persons are employed in manufacturing industries, and they have been obtained by special agents of the bureau from establishments largely patronized by working people. The prices given represent average quotations for rent, board and the various articles of household consumption. It should be recollected that to avoid misleading conclusions, due to the fact that in 1872 currency values were considerably inflated as compared with gold, the figures given in the tables for that year have been brought to the gold basis.

It will occasion no surprise to learn that a number of the ordinary articles of domestic consumption show an increase in 1902 as compared with 1897. Among these are rye flour, dried codfish, rice, beans, tea (oolong), good brown sugar, common soap and starch. All of the articles classified under the head of provisions, including meats of various kinds, lard, butter, cheese, potatoes and milk, show higher prices in the latter year as compared with the earlier. On the other hand, wheat flour, coffee (Rio, green and roasted), granulated sugar, molasses syrup and eggs are lower. Coal is higher and wood somewhat lower. Most of the kinds of dry goods particularised, shirting, sheeting, cotton flannel, ticking and prints are higher. Rents for four- and six-room tenements are higher, but quotations for board are lower. It is to be borne in mind in considering these figures that 1897 was a year of low prices, while at the time the figures before us were obtained, viz., April last, prices of meats and other provisions were unusually high.

A different showing is made, however, when a comparison is instituted with 1872. Here decreases in price in favour of the present year are the rule and increases the exception. Out of fifty-four items particularised in the table only ten show increases over the thirty-year period. Among groceries only corn meal, dried codfish and beans show increases, and among provisions, including meats, every one of which, excepting eggs, showed a gain in 1902 over 1897, the only increases noted are in forequarter of mutton, mutton chops, fresh and salted pork, and hams and potatoes. Some of the decreases are very marked, as in the cases of wheat flour and sugar, which cost only about half what they did in 1872. A computation of the percentage changes in prices for groceries and provisions as a whole is arrived at by applying to the quotations obtained the ratios determined by the Senate Finance Committee in 1892. The result indicates a decrease in the price of groceries of 7.03 per cent. in 1902, as compared with 1897, and an increase of 19.54 per cent. in the price of provisions. As compared with 1872, however, there was a decline of 44.07 per cent. in the grocery prices and of 8.88 per cent. in those of provisions. The extent of the change in prices is set forth in another way in a series of tables showing the quantity of a given commodity which could be purchased for a dollar in each of the years mentioned. Some of the results are striking. We find, for example, that of so important a commodity as family wheat flour a dollar would purchase 43.48 pounds in 1902, as compared with 15.38 pounds in 1872, while of granulated sugar a dollar would purchase 18.87 pounds in 1902, as compared with 8.33 pounds in 1872. One of the noteworthy features of the showing is the decrease in the price of board over the thirty-year period. In 1872 the average price of board for men of the class under

consideration was \$5.62; in 1902 it was \$3.91, a marked decrease as will be seen. The fall in the price of board for women has not been so marked, the decline being from \$3.75 in 1872 to \$3.34 in the present year. The cost for four-room tenements has gone down in the interval, while that for six-room tenements has gone up. It is probable that the increased rent for apartments is in part owing to the introduction of greater comforts and conveniences. An analysis is made in part of the reports of a number of family budgets, with a view of determining the effects of price changes upon the cost of living. Here the comparisons are not worked out in detail as in the case of the commodities mentioned above. A general computation indicates a decrease in 1902 of 19.92 per cent., or about one-fifth in the cost of living as compared with 1872.

EMIGRATION AND IMMIGRATION.

**** The Imperial Institute acts in concert with the Emigrants' Information Office (which is under the direction of the Colonial Office), of 31, Broadway, Westminster, S.W.; and also with the British Women's Emigration Association, now temporarily carrying on its work in rooms at the Institute. The Handbooks and Quarterly Circulars issued by the Emigrants' Information Office may be obtained at the Commercial Intelligence Office. Special information and practical advice respecting Canada and Cape Colony will also be furnished by the Curators of these Sections.**

UNITED KINGDOM.

British Women's Emigration Association.—The hon. sec. reports 312 applications received between October 21 and November 21, at the office at the Imperial Institute. The total since the beginning of the year is 5,826. The number of enquiries from would-be emigrants to South Africa, increased enormously after the declaration of peace; and again from the notices in the papers of the facilities offered by the Transvaal Government for the servants required at Johannesburg. The local Committee of the South African Expansion Committee has become an Advisory Committee to the Women's Immigration Department of the Transvaal Administration, and the selection of the women is placed in the hands of the South African Expansion Committee in London. Frequent parties are sent out under the care of the most experienced matrons of the Association. The scheme provides for the expenses of the journey being paid for each servant, and she binds herself to repay £12 in monthly instalments after her arrival in the colony. None but those requisitioned by the authorities at Johannesburg can obtain these advantages. Persons in the colony who wish to have out a servant or a relation on these terms, must apply out there to the Women's Immigration Department. Wives going to join their husbands are arranged for by the Colonial Office. There are no more indulgence passages in troopships to be had, but 287 persons recommended by the South African Committee have been granted this privilege on fifteen occasions, since July, 1901. In consequence of the increase of work the South African Committee has taken offices at 47, Victoria-street, S.W., with accommodation for a larger staff, and its various departments—Educational, Registry, etc.

The number of reception homes in South Africa is growing. Besides the one at Rosebank, another Hostel is to be built at Cape Town, on the Groot Schuur property; a Hostel is provided at 95, De Villiers-street, Johannesburg, by the Transvaal Administration; the Government of the Orange River Colony proposes to open one at Bloemfontein; the Mayor of Durban intends to build a special house for young women in business; the Natal Government has voted £200 towards the immigration of women, and the South African Expansion Committee has contributed £100 towards the establishment of a Hostel for women at Maritzburg; the Young Women's Christian Association Home at Port Elizabeth is being enlarged to receive travellers; the Hostels at Bulawayo and Salisbury are assisted by the Chartered Company; and the Committee being formed at Pretoria by Lady Lyttelton will probably undertake the matter at that centre.

Although South Africa is chiefly in the public mind at present, Canada has not been neglected by the British Women's Emigration Association. Since March 243 persons have been sent out there, either to situations or to friends, or to be placed by the local correspondents at Vancouver, Winnipeg and Montreal. The co-operation of the Women's National Immigration Society is of great value, and the kind reception of the parties with their matrons at the Home, 87, Osborne-street, Montreal, is much appreciated. Many employers in Ontario are sending over half the passage money for servants to be selected and sent out to them by the Association. A small party of these will sail on December 4, but after this date, no more will be sent until the season opens in March or April.

In addition to the 243 to Canada, 38 to Australia, 17 to New Zealand, 18 to the States, and one to Port Said—total 317—have been sent out by the British Women's Emigration Association since the beginning of the year. Loans towards passages have been granted to the amount of £346, and in the same time £278 has been received in the repayment of loans. The total number of persons to South Africa has been 436.

The Wortley Hostel is now satisfactorily established at 22, Upper Westbourne-terrace, Paddington, London, W. It is to be formally opened on December 8 at 4.30. The Earl of Meath has promised to speak. Subscribers and others interested in the work of the Association are invited to attend and to inspect the arrangements of the house. Over 160 travellers have already passed through, some parties numbering 32 at a time.

Women arriving from the Colonies can be received as temporary lodgers; and Colonial readers of this last number of the IMPERIAL INSTITUTE JOURNAL should make a note of the address. If any recipients of the JOURNAL have been in the habit of noticing the monthly reports of the emigration work carried on at the Imperial Institute, it is hoped that they may be sufficiently interested in it, to care to take in *The Imperial Colonist*, the monthly organ of the Association, to be had for 2s. 6d. a year post free, from the Hon. Sec., British Women's Emigration Association, the Imperial Institute, London, S.W.

COLONIES.

Canada's Immigrants.—The revised returns of immigration into Canada for the fiscal year ended June 30 last show that the total number of arrivals was 67,320, an increase of 18,081 over the previous year. The greatest gain was in the arrivals from the United States, the total being 26,312, as against 17,987 for the previous year, a gain of 8,325. British arrivals came next, with a gain of 5,449. The figures for the first two months of the present fiscal year show a total immigrant arrival of 15,265, as against 8,233 for the corresponding two months of the previous year. At the emigration branch of the High Commissioner's office it is anticipated that the record of the arrival of settlers in Canada for the fiscal year 1902-3 will be the most significant in the history of the department.

Emigration to South Africa.—It will not be the fault of the Austrian Government if unsuitable emigrants from that country reach the new British colonies in South Africa, or if

suitable persons proceed thither in excess of the demand for labour. A further semi-official warning has been published by several of the Vienna newspapers. It says that the emigration of Austrian subjects to South Africa is so large as to justify the suspicion that a secret agitation is being carried on for the purpose of securing emigrants. That circumstance has induced the Ministry of the Interior to give an account of the condition of affairs in the Transvaal and Orange River Colonies which it has received from a trustworthy source. This, it adds, shows that a melancholy fate awaits the emigrants. The Ministry furthermore calls attention to the restrictions imposed by the British authorities upon foreign emigrants, and to the fact that numbers of the latter are already obliged to spend three months and more in the coast towns, where the majority of them can find no work. The Ministry, consequently, warns all intending emigrants against those who, for the sake of fees, promise them work in the new colonies, and thus secure an income by criminal means. The *communiqué* concludes by stating that all persons who carry on a propaganda in favour of emigration will be proceeded against with the utmost rigour.—*The Times.*

CUSTOMS TARIFFS. UNITED KINGDOM.

Import Duty on Dextrine.—The following General Order, dated the 30th ult., has been issued by the Board of Customs, fixing the rate of import duty leviable on dextrine imported into the United Kingdom:—

"The Board direct, with reference to Section 7 of the Finance Act, 1901, that on and after the 3rd proximo, imported dextrine be charged with duty at the rate of 6½d. the cwt. on the net weight of the article."

COLONIES.

Australian Commonwealth.—**DRAWBACK REGULATIONS UNDER EXCISE ACT, 1901.**—A copy of the *Commonwealth of Australia Gazette* for 19th September, 1902, contains drawback regulations made under the Excise Act, 1901, as follows:—

Drawback Regulations.—Several items of drawback, though each less than £1, may, if they total £1, be included and allowed in one claim or debenture. In the case of goods exported on or after the 1st day of September, 1902, the drawback allowable pursuant to the Act and Regulations shall be the full amount of duty paid, if such duty shall have been paid under any Tariff of the Commonwealth, notwithstanding it may be more than the Excise duty payable at the time of export.

FREE IMPORTATION OF CERTAIN ARTICLES FOR NAVAL AND MILITARY UNIFORMS.—A Customs By-Law dated 13th September, 1902, is also published in the same *Gazette*, notifying that—

Accoutrements, badges, buttons, braid and lace for naval and military uniforms may be delivered for home consumption, free of duty, provided the Collector is first satisfied that such goods are intended to be forthwith so used, and that security to the satisfaction of the Collector is also first furnished to him by the importer that the same shall be so used, and that within six months from the date of such delivery proof shall be given to, and to the satisfaction of, the Collector that such goods have been so used by the importer.

CUSTOMS REGULATIONS.—The Board of Trade have received a copy of Regulations, issued by the Commonwealth Department of Trade and Customs on the 19th September, 1902, under sec. 163 of the Customs Act of 1901. The Regulations in question are as follows:—

Claims for refunds, rebates, or remissions of duty under Section 163 of the Customs Act, 1901, may be made not later than three days after the goods have passed from the control of the Customs or the duty has been paid, or such further time, not later than one week from such passing or payment as the Comptroller-General shall, in writing, see fit to allow. But unless made as aforesaid no such claim shall be received or allowed.

Bahamas.—**EXPORT DUTY ON PINEAPPLE PLANTS.**—The Board of Trade have received a copy of the Bahamas "Export Duty Act, 1902" (No. 24 of 1902), which received the assent of the Governor-in-Council on 14th May, 1902, and which provides for the imposition of a duty on all pineapple plants exported from the Bahama Islands, the export duty to be at the rate of 10s. for the first hundred, with an additional duty of 10s. for every hundred or part of a hundred thereafter.

The above Act will come into force upon a date which will be notified in the Official Gazette, and will continue in force for two years from the date of passing, and from thence to the end of the next Session of Assembly. It is provided in the Act that the words "pineapple plants" are to mean slips, suckers or tops of pineapples to be used for the purposes of planting.

WIRELESS TELEGRAPHY RESTRICTED, EXCEPT UNDER CERTAIN CONDITIONS.—A copy of a "Wireless Telegraphy Restriction Act, 1902" (No. 22 of 1902) was received at the same time, which was also assented to by the Governor-in-Council on 14th May, 1902. The present Act provides that it shall be unlawful for any person in the Bahama Islands to transmit or receive messages across the seas by means of any wireless telegraphy whatsoever, unless such person shall have previously received the consent, in writing, of the Colonial Secretary of the Governor-in-Council authorising the same. Any person violating the provisions of the Act is liable, on summary conviction, to a penalty not exceeding £200.

Barbados.—At a special meeting of the Legislature on the 21st October, a Bill to increase the duties on all imported articles by 20 per cent. was introduced and passed through its various stages to come into operation the following morning. The Bill also contained a passage to increase the Excise duties on rum and tobacco of local manufacture in a similar manner. This measure has not met with general favour, but has been hurried through its stages and passed as the quickest and most expedient way to raise the funds necessary to meet the expenses of the small-pox outbreak.

Natal.—**FURTHER EXTENSION OF TIME FOR FREE IMPORTATION OF FOREIGN WHEAT, ETC.**—A Protocol to the Customs Union Convention of 1898 provides that flour, wheaten, and wheaten meal (including pollard) manufactured from other than South African wheat, and intended for consumption in the Colony of Natal, may be imported free of duty to 3rd January, 1904.

St. Lucia.—**IMPORTATION OF CATTLE FROM ST. VINCENT PROHIBITED.**—The Board of Trade have received from the Administrator of St. Lucia a copy of an Order-in-Council dated 20th October, 1902, prohibiting under Sec. 109 (1) of the Customs Ordinance, 1888, the importation of cattle from St. Vincent, in consequence of the existence of anthrax in that colony.

IMPORTATION OF GOODS FROM BARBADOS PROHIBITED.—A copy of an Order-in-Council, approved and passed by the Governor-in-Council on 21st October, 1902, has also been received, by which, under the authority of Ordinance No. 13 of 1902, the importation into St. Lucia from the island of Barbados so long as that island continues to be an infected place under the Quarantine Ordinance, 1895, on account of the existence of

small-pox) of articles, goods, and things whatsoever, except mails which have been previously fumigated, is absolutely prohibited; provided that the clothing and personal effects of passengers arriving therefrom may, at the discretion of the Health Officer, and after being disinfected in such manner as shall be directed by the quarantine authority, be admitted.

It is further ordered, under the same authority, that the term of detention in quarantine of any vessel or person arriving from Barbados, so long as that island is an affected place, as aforesaid, shall be for a period of 21 days from the departure of such vessel or person from Barbados, or from the time such vessel became an "infected vessel" within the meaning of the Quarantine Ordinance, 1895.

INDIA.

Countervailing Duty on Sugar from France.—Customs Circular (No. 16 of 1902), issued by the Finance and Commerce Department of the Government of India on the 16th October, 1902, revises the rates of additional duties on bounty-fed sugar imported into India from France, to come into effect from the 1st September, 1902, as follows:—

Kinds of Sugar.	Additional Duties Levied.	
	Old Rate.	New Rate.
	R. a. p.	R. a. p.
Raw sugars from 65 to 98 per cent. polarisation for beet-root sugars, or 65 to 97 for French Colonial sugar	3 0 1	2 13 11
Sugar Candies - - - - -	3 2 3	2 15 6
Refined sugars, in loaf or crushed, clear, hard and dry - - -	3 2 3	2 15 6
Raw and refined sugars, in grains or crystals, of a minimum standard of 98 per cent. polarisation - - -	3 1 2	2 14 9

FOREIGN COUNTRIES.

Argentina.—CLASSIFICATION IN EXPORT TARIFF OF OLD STEEL.—The *Boletín Oficial de la Republica Argentina* for the 17th September last, contains a copy of a Decree, dated the 15th September, which provides that old steel shall be included, from the 20th September, in the heading of the Export Tariff for old iron. The export duty payable thereon will consequently be 5 pesos per 1,000 kilogrammes.

France.—CUSTOMS CIRCULARS.—Circulars recently issued by the French Customs Department contain the following decisions relative to the application of the French Customs Tariff:—

Vanilla imported from French Establishments in Oceania.—The quantity of vanilla which may be imported into France from French establishments in Oceania, under special conditions, has been fixed by a Decree of 16th August last at 10,000 kilogs. for the period from 1st July, 1902, to 30th June, 1903.

Allowance for waste on French Colonial Sugars.—The allowance for waste in manufacture granted to sugars of French colonies shipped to France has been fixed at 27.64 per cent. for the season from the 1st September, 1902, to the 31st August, 1903.

Twisted cotton yarns in small balls, for the shuttles of embroidering machines, are to be classed under the Tariff heading applicable to "Twisted cotton yarns in ordinary skeins."

Russia.—IMPORT DUTY ON MAGIC LANTERN SLIDES.—The Board of Trade have received notice, through the Foreign Office, that according to a Circular of the Russian Customs Department, dated 2nd/15th ult., magic lantern slides, independently of their size and the material of which made, are to be dutiable on importation into Russia under Section 169 of the Tariff, at the rate of 10 roubles 20 copecks per pound (£3. 7s. per cwt.).

Servia.—CUSTOMS TREATMENT OF WOOLLEN TISSUES FOR LADIES' COSTUMES.—The Board of Trade have received a translation of a Circular of the Servian Customs Department, dated the 3rd/16th ult., notifying all Custom-houses in Servia that woollen tissues for ladies' costumes are properly dutiable under Article 42 of the General Customs Tariff, and Article 9 c. 2 of the Conventional Tariff at the rate of 120 dinars per 100 kilogrammes (£4. 8s. 9d. per cwt.).

Turkey.—EXPORT DUTY ON HORSES.—The Board of Trade have received information, through the Foreign Office, to the effect that the issue is announced of an Imperial Iradé by which the tax of £T5 on every horse exported from Turkey is abolished and an *ad valorem* duty of 1 per cent. is substituted therefor.

United States.—COUNTERVAILING DUTIES ON DUTCH SUGARS.—A Circular recently issued by the United States' Treasury Department alters the rates of countervailing duties leviable in the States on bounty-fed sugars produced in the Netherlands. The following is the text of the Circular:—

"In pursuance of the provisions of Section 5 of the Act of 24th July, 1897, the following net amounts of the bounties paid or bestowed by the Government of the Netherlands on the export of sugars produced in that country are hereby declared for the assessment and liquidation of additional duties:—

"1. On raw sugar produced from beet roots, 1.16 florins per 100 kilogrammes of hard refined. (The output of refined sugar from raw is computed by deducting from the polarization of the raw sugar twice the glucose, four times the ashes, and 1½ per cent. for loss in refining.)

"2. On sugar refined from beet-root raw sugar produced in the Netherlands, 1.31 florins per 100 kilogrammes.

"3. On sugar refined from imported raw sugar 0.15 florin per 100 kilogrammes, in addition to bounty, if any, allowed on the raw sugar by the country of production.

"The liquidation of entries covering sugars produced in the Netherlands after 1st September, 1902, may be suspended at the request of the importers until the next ascertainment and declaration under the provisions of said Section 5, and the additional duties on such suspended entries be estimated on the basis of the bounties herein specified."

Commercial Education.—The London Chamber of Commerce, in order to further promote commercial education and with the view of increasing the supply of qualified teachers of commercial subjects, has offered to admit at half fees head teachers and their assistants to its regular courses of lectures in banking and currency, commercial and industrial law, and the machinery and methods of business. Lectures are now delivered at the London Commercial Sale-rooms, Mincing-lane, E.C., the rooms formerly used at the London Chamber of Commerce being found inadequate to accommodate the large number of students already attending the courses. Should a sufficient number of teachers take advantage of the opportunities afforded them, arrangements will at once be made to repeat the lectures of each course that have already been delivered. Full particulars may be obtained, free of charge, from the Commercial Education Department of the London Chamber of Commerce, 10, Eastcheap, E.C.

TRANSPORT AND FREIGHTS.

The Freight Market.—Outward rates to Brazil and Argentina are weak, but remain fairly steady in other directions. Last fixtures have been: 3s. 6d. Malta, 4s. 9d. Genoa, 5s. Alexandria or Port Said, 6s. Venice, 6s. Las Palmas, 8s. River Plate, 9s. 6d. Rio, 9s. Colombo, 13s. 6d. South Africa. American markets continue weak. Grain rate down to 1s. 3d. for prompt loading. On account of the competition of the South African lines, several tramp steamers have been chartered to keep the various berths filled. Australia quiet; no improvement can reasonably be expected for another twelve months, as it is now definitely known that the wheat crop is a failure, and large supplies will have to be imported from the United States. Black Sea completely demoralised. Odessa berth quoted at 7s. A number of steamers fixed from Danube have been thrown up by their charterers. Eastern markets remain steady. Burma has commenced to operate for new season at about 21s. 3d. Mediterranean markets continue weak. River Plate still paying 17s., but there is less enquiry. WEDDEL, TURNER & Co., November 22nd, 1902.

UNITED KINGDOM.

Glasgow.—The special committee appointed by the Clyde Trust to consider the river and harbour improvement have resolved to widen and deepen the river, in order to meet the requirements of local shipbuilders, who have been invited to enter for new Cunarders. The work will be entered upon at once, and will occupy close upon two years. The largest type of vessel, warship or other, will be able to navigate the river.

Port of London.—After consideration of the report of the engineer, which was presented in June, the Thames Conservators have determined to dredge the river, so that there will be a depth of water at lowest spring tides of 14 feet between London Bridge and the Thames Tunnel, the channel being 200 feet broad, this being the greatest width possible, owing to the tiers. Below the Thames Tunnel the depth will be increased to 16 feet in a channel 300 feet wide. The cost of this work is estimated at £54,000. At present the depth of the river above the Thames Tunnel is, in some places, no more than 10 feet 6 inches at low tide, owing to silting-up. It is stated that in this part of the channel a greater depth than 14 feet is not practicable, because there is only 13 feet over the roof of the tunnel, and a certain thickness of soil must be left above the top of the tunnel.

The Pacific Cable.—The Pacific Cable will be opened for public traffic on Monday, December 8. Messages from any part of the United Kingdom to Australia, New Zealand, Norfolk Island, or Fiji will be charged at the rate of 3s. per word. Messages may be handed in for transmission by this route at the office of any of the Atlantic cable companies, or at any post office in the United Kingdom. Messages will be delivered to code addresses registered at the post office, or with the Atlantic companies. All persons desiring to avail themselves of the Pacific cable route are informed that the Atlantic companies register code addresses free.

COLONIES.

Canada.—NEW RAILWAY FROM GASPÉ.—A company has been formed under the title, the New Canadian Company, Limited, the chief objects of which are:—the acquisition of the benefit of an Act of Parliament of the Province of Quebec for the incorporation of a company entitled the Atlantic, Quebec and Western Railway Company, for the construction and working of a line of railway, about 140 miles in length, commencing at the harbour of Gaspé in the Gulf of St. Lawrence, thence through the interior of the peninsula of Gaspé to a point north of Causapsal, where junction would be effected with the Government Inter-colonial Railway; to undertake the issue of the capital and debenture stock of the railway company; and to carry out the construction of the line. A full statement regarding the prospects of the line has been issued by the New Canadian Company. Sir Douglas Fox and Partners are the consulting engineers. The remarkable development of the Canadian North-West, and the rapid settlement of its fertile lands during the past two or three years, are attracting widespread attention on this continent and abroad. The splendid possibilities of the country are beginning to enter into the calculations of the railway men, who are providing means to reach the enormous trade it must produce in the near future. The Canadian Pacific Railway is strengthening its branches in every direction; the Canadian Northern is pushing on towards the Rockies; and it is now stated that Canada's pioneer railway will be extended across the continent. Mr. Hays, general manager of the Grand Trunk, officially announces that the company is prepared to go ahead with the trans-continental railway. An application will be made to the Dominion Parliament in the coming session to incorporate the Grand Trunk Pacific Railway to run from North Bay or Gravenhurst, points on the existing line, through New Ontario to Manitoba and the North-West Territories, and thence, *via* Peace River or Pine River, to either Bute Inlet or Port Simpson on the Pacific coast.

Cyprus.—HARBOUR IMPROVEMENTS AT FAMAGUSTA.—The Government are about to construct harbour works at Famagusta, and the agents for the Crown Colonies have placed the contract for the construction of the works with Mr. C. J. Wills, of London and Westminster. The works will commence immediately. The principal works are the building of the sea wall and the dredging.

Jamaica.—INCREASED EXPORT OF FRUIT.—Advices from Jamaica states that the exports from Jamaica to England of oranges and bananas have greatly increased of late, as the following figures show. In September 1900, 119,082 bunches of bananas were exported; in 1901 the figures were 240,314, while in 1902 531,644 bunches were exported. For the nine months ending September the figures were: 1900, 963,340; 1901, 1,633,911; 1902, 1,962,430. As regards oranges, the following numbers were exported for the same month: 1900, 3,938; 1901, 2,738; 1902, 7,366. For the nine months ending September, the figures for the same years are as follow: 3,672,959; 3,538,830; 4,826,785. Proportionate increases have also taken place in the shipments of fruit from Jamaica to the United States, which are on a larger scale than those to the United Kingdom.

New Atlantic Service.—The Grand Trunk Railway of Canada has arranged for a new fortnightly service of steamers between Portland (Maine) and Avonmouth. The service begins in December and will be maintained by three steamers of large capacity—the *Manxman*, *Ottoman*, and *Roman*—owned by the Ocean Transport Company of Liverpool. Throughout the winter they will carry Canadian produce—particularly grain, bacon, cheese, and butter. A new service between Boston and Avonmouth was recently announced.

FOREIGN COUNTRIES.

Bulgaria.—H.M. Consul-General at Sofia reports that railway freights on petroleum imported by Varna and Bourgas have been reduced. This reduction favours Russian oils and tends to divert trade from Constantinople, Dedagatch, and

Salonica, and the Oriental railways to the Bulgarian ports and lines.

France.—A Company named the "Lloyd Normand" has been formed at Cherbourg by M. E. Le Pont for running four or five steamers in competition with the present coasting schooners between France and England. The intention is to ship paving stones to England and take back cargoes of bale goods or coals to Cherbourg. One boat has already been purchased from an English Railway Company for the new line. —*Fairplay*.

Java, China, and Japan.—NEW DUTCH COMPANY.—It is stated that a new Dutch shipping company has been formed, with a capital of 6,000,000 florins, for the purpose of establishing a steamship service between Java, China and Japan, the ports of call including Batavia, Samarang, Hong Kong, Shanghai, Kobe-Hiogo, and Yokohama. The Dutch Government have undertaken to grant an annual subsidy of 300,000 florins for the maintenance of a monthly service of steamers during the first five years, 250,000 florins per annum for the second five years, and 200,000 florins during each of the succeeding five years. The company will commence operations in September of next year with steamers of a displacement of 5,000 tons. —*Journal of Commerce*.

Mexico and South Africa.—NEW STEAMSHIP LINE.—The Lingham Timber and Trading Co., Ltd., London and Johannesburg, intend to establish a new line of steamers between Mexican Gulf ports and Delagoa Bay. The first steamer for the new service has just been launched by the Northumberland Shipbuilding Co., Ltd., Howdon-on-Tyne. This vessel, named *Oakwood*, is of the spar deck type, with dimensions 373 ft. by 48 ft. by 30 ft. 10 in., and carries fully 7,000 tons deadweight on a light draught. Refrigerating machinery is fitted for the carrying of frozen meat and produce, whilst the decks will be arranged for conveying a large number of Mexican cattle. —*Liverpool Journal of Commerce*.

Railway Construction in Southern Persia.—The *Times* learns from a trustworthy source that a combination of financiers and engineers has been formed in Paris with a view to the construction of railways in Southern Persia. A party of engineers is, it is understood, leaving Paris for Persia in connection with this object.

Roumania.—THE SULINA BRANCH OF THE DANUBE.—In an article on the new cutting in the Sulina branch of the Danube, a correspondent of the *Times* writes:—"It is curiously illustrative of the extent to which interest in the affairs of the Near East has faded in this country, that the completion of the engineering works on the Danube—an event of so much direct importance to British trade, and especially to merchant shipping—should have passed almost unnoticed. An announcement did appear that the Danube Canal (as it was called) from Braila to Sulina was inaugurated on October 19, but many of those who read the words had the vaguest possible idea as to the position on the map of either of the places named, and some had never even heard of them. Moreover, the cutting referred to does not happen to be a canal at all, but a new channel along which the Sulina branch now flows almost in a straight line, instead of, as formerly, through an infinity of sharp curves rendering navigation difficult, and with modern large vessels impossible. The subject seems to be worthy of more attention than it has hitherto received, for during the year 1901 no less than 12,892,921 quarters of grain were exported from the Sulina mouth of the Danube, a large proportion of which doubtless found its way to these shores, while it furnished cargoes for no less than 461 British steamers of a total aggregate tonnage of 804,304.

"The Sulina branch of the Danube has, therefore, a special claim on the attention of the British public, even apart from the fact that the history of its regularization forms a record of British enterprise and engineering skill.

"To anyone reading in current numbers of shipping papers that vessels of 6,000 and 7,000 tons burden have been chartered for Galatz or Braila, it must be difficult to realise that there was a time when a vessel of 300 tons could not cross the bar at Sulina when fully laden; yet this is the fact. And in addition to the deepening of the entrance channel from 7 feet to 24 feet, the river has been straightened, and the distance to the sea shortened by nearly 15 miles, while the depth at low water ranges between 18 feet and 24 feet."

OFFICIAL AND COMMERCIAL CONTRACTS.

UNITED KINGDOM.

Bridgewater.—The Port and Navigation Committee of Bridgewater invite, until the 28th of February next, plans, specifications and estimates for Power and Appliances to deal with the accumulations of silt in the River Parrett. Particulars (£2. 2s.) may be obtained from W. T. Baker, town-clerk.

Bristol.—TENDERS are invited until the 11th inst. (from boiler-makers only) for WATER TUBE BOILERS and Accessories. Particulars (£2. 2s.) may be obtained from H. Faraday Proctor, city electrical engineer, Electricity Department, Bristol.

Ireland (Great Southern and Western Railway).—TENDERS are invited until the 19th inst. for the CONSTRUCTION of a BRANCH RAILWAY from Gould's Cross Station, on the main line, to Cashel, approximately 5½ miles. Particulars may be obtained at the office of the company's engineer, Inchincore, Dublin.

London (West Ham).—TENDERS are invited until the 9th inst. for providing and fixing Low-pressure Hot Water HEATING APPARATUS, Hot Water Supplies, Mains, etc., at Plaistow Fever Hospital. Particulars (£5) may be obtained from Mr. Edwin T. Hall, F.R.I.B.A., 54, Bedford-square, W.C.

Swansea.—TENDERS are invited until the 18th inst. for the EXTENSION of the HALF TIDE BASIN of the SOUTH DOCK. Particulars (£5. 5s.) may be obtained from Mr. A. O. Schenk, M.I.C.E., Harbour Offices, Swansea.

COLONIES.

Cape Colony.—TENDERS are invited, until the 27th January, for the CONSTRUCTION of certain STREETS, including the Quarrying, Dressing, Hauling, Laying, and Finishing of about 40,000 lineal yards of Granite Kerbing; 41,000 lineal yards of Granite Guttering; 110,000 square yards of Tar Macadam Footways; 204,000 square yards of Hand-packed Foundation; 204,000 square yards Pavement, with all necessary Excavations. Particulars may be obtained from Messrs. Davis and Soper, 54, St. Mary Axe, London, E.C.

The Cape Government's contemplated expenditure on harbour works includes £14,000 for a hydraulic crane system on the new quay wall, Port Elizabeth, a crane equipment on the east bank, besides other landing and shipping plant. The East London Harbour Board are also about to give out orders for four steam cranes and a number of hydraulic cranes to the value of £14,000 for the several new wharf extensions which are projected, and to expend a sum of £15,000 for transporters,

Rhodesia.—TENDERS are invited, until the 28th February, for the ESTABLISHMENT and WORKING of an ELECTRIC TRAMWAY SYSTEM for the Municipality of Bulawayo. Particulars may be obtained from Messrs. Davis and Soper, 54, St. Mary Axe, London, E.C.

Victoria.—TENDERS are invited until the 30th inst. for the SUPPLY of COIR YARN to the Penal Establishment, Pentridge (Victoria). Particulars may be obtained from the office of the secretary to the Tender Board, Treasury, Melbourne.

INDIA.

East India Railway.—TENDERS are invited, until the 10th inst., for the SUPPLY and DELIVERY of GOODS ENGINES and TENDERS. Particulars (£1. 1s.) may be obtained from C. W. Young, Nicholas-lane, London, E.C.

FOREIGN COUNTRIES.

Egypt.—TENDERS are invited until the 5th inst. for the SUPPLY of 204 metric tons of COLOURED COTTON WASTE. Particulars (2s.) may be obtained from Lieut.-Col. Western, R.E., C.M.G., Broadway-chambers, Westminster, S.W. TENDERS are also invited until the 15th inst. for the SUPPLY of IRONMONGERY for doors and windows during the year 1903. Particulars (2s.) may be obtained from the same office.

The Khedivial Agricultural Society is prepared to receive offers for the SUPPLY of MINERAL SUPERPHOSPHATE during the months of December, January, February and March next. Each delivery is not to be less than 300 tons. The manure must be guaranteed to contain from 16 to 18 per cent. of phosphoric acid (soluble), and the price quoted must be f.o.b. Alexandria in single sacks. Offers should be addressed to Mr. G. P. Foaden, Khedivial Agricultural Society, Cairo, from whom further information may be obtained.

Roumania.—TENDERS are invited until the 20th inst. for the SUPPLY of MEDICINES and DRUGS necessary for the Central Pharmacy during a period of two years. Particulars may be obtained from the Curatelle Saint Spiridon, Jassy, Roumania.

Spain.—TENDERS are invited until the 16th inst. for the CONSTRUCTION of the new CASA CONSISTORIAL in Corunna. Particulars may be obtained from the Direccion de Administracion, Madrid. TENDERS are also invited until the 10th inst. for BUILDING a shelter and outfitting DOCK at and extending the Port of Alicante. Particulars may be obtained from the Office of the Ministry of Public Works, Madrid. TENDERS are also invited until the 10th inst. for carrying out the interior IMPROVEMENT WORKS of the PORT of LLANES, province of Oviedo. Particulars may be obtained from the Office of the Ministry of Public Works, Madrid.

COMMERCIAL LAW INTELLIGENCE.

The Sale of Wheaten Meal.—At the Middlesex Sessions, before Sir R. D. M. Littler, K.C., and other justices, Messrs. HOOD AND MOORE (LIMITED), flour merchants, appealed against a conviction by the Brentford justices for having sold wheaten flour containing bran. An inspector under the Food and Drugs Act visited defendants' shop at Chiswick, and asked for a half-quartern bag of wheaten flour, for which he paid 2½d. Wheaten flour was well understood, and he had often purchased it. After the sale was completed he saw the words "Wheat meal" on the bag. The sample was sent to the analyst, who certified it contained 88 per cent. wheaten flour and 12 per cent. bran. Mr. Edward Bevan, official analyst to the county of Middlesex, said that flour should be the fine portion of wheat, free from the husk. He described the article sold by defendants as whole meal, though he would not say it was inferior to wheat meal. Mr. C. B. Braden, of the London Corn Exchange, stated that flour and meal were not synonymous terms in relation to any particular grain. Wheaten flour was an antiquated term, confusing to the trade, and he only knew it to be used in the Book of Exodus. For the appellant it was urged there was neither adulteration nor admixture, and the article was sold in the state that nature made it. The fact was that the term wheaten flour was so obsolete that the assistant confused it with "wheat meal," and that was how the mistake arose. On the suggestion of the chairman, the legal gentlemen conferred together, and it was agreed that the appeal should be allowed, on the defendants undertaking that they would not sell the material as wheat flour. If it was sold as whole meal there could be no possible objection. The chairman, in assenting to these terms, said that no doubt there was a sale to the prejudice of the purchaser, and assistants should be very careful in listening to what they were asked for.

Right of Sale.—In the Commercial Court, before Mr. Justice Kennedy, an action was brought by the plaintiff, Mr. JAMES RYAN, against the defendants, Messrs. W. H. RIDLEY AND CO., to recover £114 6s. 7d. for breach of contract. The case involved a short point of some interest with regard to a clause which is not uncommon in commercial contracts—viz., whether where by a contract for the sale of perishable articles payment is to be made "by cash . . . in exchange for" shipping documents, the buyer is under an obligation to pay within a reasonable time after the shipping documents are tendered to him, and whether, if he does not do this, the seller is entitled to sell the goods against him and to claim the loss which he has suffered. On October 15, 1901, the plaintiff sold to the defendants the cargo of Newfoundland codfish, "about 2,500 quintals as shipped, per bill of lading, per *Margaret*, at Bonavista, sailed on October 9 to Lisbon for orders to be delivered at Bari at the price of 22s. per quintal, including cost, freight, and insurance, payment to be made by cash in London in exchange for bill of lading and policy of insurance less 1½ per cent. discount." The *Margaret* arrived at Lisbon on October 24, 1901, and shortly afterwards the plaintiff tendered the shipping documents and requested payment in exchange. The payment not having been made by the defendants on November 1, 1901, the cargo was sold a day or two later by the plaintiff, who now sought to recover from the defendants the loss which he suffered by the sale. Mr. Justice Kennedy, in giving judgment, said that the defendants refused to pay in exchange for the bill of lading and policy of insurance. In his opinion, the defendants had no legal right to do this. They took up the position that they would pay within a week, and insisted on the *Margaret* going on although they had not paid. The words in the clause must be given their natural meaning, and "cash against documents" meant that when the documents were tendered the cash must be ready. But a practical meaning must be given to the words, and they did not mean that if the seller walked into the buyer's office and offered the documents, the buyer would have committed a breach of contract because he did not at once tender a cheque. That would not be business. The clause meant that the payment against the documents must be made within a reasonable time—e.g., if the buyer said, "You shall have a cheque to-morrow morning," that would be sufficient, or even a greater delay would not be unreasonable if it would not affect the rights of the parties. If ever there was a case in which the nature of the cargo demanded promptitude, that of the cargo in the

present case did. In his opinion, the plaintiff was entitled to succeed, because the defendants had refused to comply with a term of the contract which, in this case, was essential. In his opinion, the term was not merely one with regard to the time of payment. No property passed to the defendants till the condition named in the clause was performed—namely, until the defendants received the bill of lading and policy of insurance. To those documents the defendants were not entitled until payment. The plaintiff had exercised his right of sale without being unreasonable in any way, and there must be judgment for him for the amount claimed with costs. Judgment accordingly.

Stockbroker and Client.—A question of considerable importance to the public in relation to Stock Exchange transactions recently came before Mr. Justice Kennedy, in the case of *GILL v. SHEPHERD AND CO.* Mr. Gill employed the defendants, Messrs. Shepherd and Co., who are brokers on the London Stock Exchange, to sell certain mining shares for him. The defendants sent a sold note to the plaintiff for special settlement, and subject to the rules of the Stock Exchange, the price of the shares in the sold note being £6 a share. The jobber's name was not disclosed upon the sold note. The jobber failed to comply with his bargain with the defendants, and the Committee of the Stock Exchange fixed the "hammering" price of the shares at £2 a share. Mr. Gill thereupon sued the brokers for the £6 a share, his case being that by the rules and custom of the London Stock Exchange, they, by not disclosing the name of the jobber or purchaser of the shares, became principals in the transaction, as between themselves and the plaintiff, and liable to him for the purchase price of the shares. He called Mr. Richardson, the official assignee of the Stock Exchange; Mr. Venables, a member of the Committee; and a Mr. Blunt, member of the firm of Messrs. Scrimgeour, stockbrokers, but they all said that there was no such custom, and judgment was given for the defendants. Until the evidence given in the case is displaced (it is difficult to see how better evidence can be given) it must be taken that, however respectable and substantial may be the stockbrokers a member of the public employs to sell shares, he has no security in the shape of any personal liability on the part of the brokers if the jobber to whom they have sold the shares fails to complete his bargain with them, even though the client knows nothing of the jobber to whom the brokers have sold his stock, nor of what bargain, in addition to his own, may have been made by his brokers with the jobber.

Life Insurance Case.—In the Court of Appeal the case of *STUART v. FREEMAN* was heard on appeal from the judgment of Mr. Justice Ridley. The plaintiff, Mr. Stuart, was the assignee of a policy of insurance effected on the life of the Hon. Francis Charles Lawley for £2,500 granted by the General Life Assurance Company in November, 1889. By the terms of the policy the premiums were payable quarterly, and in the event of any premium being in arrear more than 30 days the policy was to become void. On September 17, 1901, one quarter's premium, due on August 18, had been in arrear 30 days. On September 18 the plaintiff paid and the defendant gave a receipt for the premium, then overdue. At the time of the payment the Hon. F. C. Lawley had died, namely at two o'clock on September 18, though the fact of his death was unknown to both the plaintiff and defendant, the manager of the Company. The defendant, for whom judgment was given in the Court below, refused to pay, substantially on the ground that the acceptance and receipt on the premium for the insurance of the life of a person who was then dead could not possibly extend the policy, which, by reason of arrear of payment, had temporarily lapsed. At the trial the plaintiff pleaded that the policy had not lapsed. It was a policy for a year, the premiums for each such period being payable in four equal instalments for convenience only. Evidence was given that on a previous occasion, when the premium was tendered after the days of grace had expired, a clerk said the manager had said the premium would be accepted if paid a day or so after. Mr. Justice Ridley only left to the jury the question whether the conversation alleged by the plaintiff to have taken place between his clerk and the clerk to the insurance company had in fact taken place, and they answered in favour of the plaintiff. His Lordship, however, entered judgment for the defendant, holding as a matter of law that there was no liability on the Company to pay on the policy, which, by reason of the condition as to payment of the premiums within thirty days of their becoming due, had become void. At the conclusion of counsel's arguments the Court of Appeal held that under the circumstances the plaintiff was entitled to succeed, and they entered judgment for him with costs for the amount of the policy and £100, the agreed interest.

BRITISH CONSULAR REPORTS.

China.—In the report on the trade of China for the year 1901 by the British Commercial Attaché at Peking, it is stated, with regard to silk, that it is difficult to arrive at an estimate of its annual production in China, but competent authorities are inclined to place it at 350,000 to 400,000 piculs. Two-thirds of the production of Central China are said to be retained for home consumption, and 50 per cent. of that of Southern China to go abroad. The volume of the export trade does not show any material increase, and the percentage it constitutes of the value of China's total exports remains the same in 1901 as in 1892, namely, 37 per cent. of the whole. . . . In the matter of disease among the worms the Chinese grower is apathetic in the extreme. Time and time again have attempts been made to induce him to adopt the Pasteur system. Pamphlets in Chinese, pointing out the advantages thereof, have been distributed throughout the silk districts, and enlightened officials have established schools of sericulture, demonstrating practically the difference between the new and the old methods. It is, therefore, matter of great regret that so little attention should be paid by the country people to these well-meant efforts to improve the silk industry and benefit themselves.

While the aggregate export of silk and its products has not varied greatly, a considerable falling-off has to be recorded in the export of white native reeled silk, which in 1892 amounted to 75,722 piculs. Its place has been taken by the output of the steam filatures, which of recent years have been widely introduced in the Canton and Shanghai districts. Prior to their establishment China was the only country in the world producing high-class, hand-spun, coarse-sized silk reeled from the live cocoon. This imparted to the thread an elasticity of fibre which was not obtainable in silk reeled from the dead cocoon, and the silk thus prepared occupied a unique position in foreign markets in spite of its coarseness and occasional unevenness. Years have been expressed that, by adopting the steam filature process, China is virtually abandoning her monopoly, and by entering into competition with the fine-sized silks of the rest of the world jeopardising her trade. Figures would not, however, seem to justify such apprehension. The export of steam filatures has gone on steadily increasing, and in the course of the last two years has exceeded that of white silk. The tendency of the manufacturers of Europe is to demand a fine-sized evenly-reeled silk, and enquiries for hand-reeled silk are consequently not sustained.

Attempts to reel yellow and wild silks in steam filatures have not proved very successful. Western China and Shantung are

the principal sources of supply of the former, and a filature was started at Hankow for reeling it, but only small quantities of the output are offered for sale to Europeans. Yellow silk is occasionally sent down from Shantung, and, very occasionally, from the Yangtzu to Canton, to be re-reeled. No attempts to re-reel in Shanghai have apparently been made. Wild silk is produced from worms fed on leaves of oaks grown on the southern faces of the hill-slopes in the Manchurian province of Fengtien. A certain proportion is spun locally, but the major quantity of the wild cocoons are exported to Shantung, where they are spun in so-called steam filatures, and produce a much higher class silk. The former, known as ordinary tussah, fetches 200 taels per picul, whereas the value of Chefoo tussah filatures is 260 to 310 taels per picul. It will be noted that the export of silk piece-goods does not advance, and considering the fine quality of the Chinese stuff this seems remarkable. Competition on the part of Japan, which displays a greater readiness to meet European taste, and unevenness in weaving, are said to be the principal causes of this stagnation.

Cuba.—A report on the trade of Cuba states that the vitality shown by Cuba in the rapid rehabilitation of its sugar industry during 1899-1900, with practically no financial assistance from abroad, has been still more strikingly exemplified by the remarkable progress which has been made, in spite of the continued steady fall in the value of sugar and the discouraging prospects of the market. The crop of 1900-01, which proved to amount to 635,856 tons, realised very fair prices on the whole, averaging a little over 10s. per cwt.; but the fall which commenced in January became far more accentuated in September, and the known existence of unusually large stocks of beet as well as cane sugar in the principal markets excited the gravest apprehensions among the planters. Meetings were held, and appeals, which received the active support of the Military Governor, were made to the United States Government to grant a reduction in the duties on Cuban sugar, in which it was positively stated that, if the existing crisis continued, a large proportion of the factories would be shut down, thousands of people would be thrown out of employment, commerce would be paralysed, the revenues of the Government would fall off, and widespread misery culminating probably in public disorders would be the result.

After months of agitation in the Press of the United States as well as of Cuba, the American Congress adjourned without having done anything in the matter, and in the meanwhile by far the largest crop taken in since 1895, amounting to over 800,000 tons, was successfully harvested and has eventually been sold at prices which have averaged a trifle over 6s. 7d. per cwt. In spite of the very low price obtained, none of the evils which were so confidently predicted have come to pass. Not a single factory failed to work to its fullest extent; the demand for labour, in view of the magnitude of the crop, was greater if anything than in previous years; and the low price at which the sugar was sold being compensated by the much larger output, imports, and consequently also the Customs receipts, have shown no falling-off at all—rather the contrary. Moreover, to the surprise of everybody, the threatened severe losses to individual planters have been proved to be wholly imaginary and, while the profits have not, of course, been sufficient to meet heavy mortgage charges, there were no well-appointed estates on which the working expenses were not amply covered, besides leaving in many cases a small margin of profit.

The crisis then, far from being disastrous, has really been of immense service to the island, in forcing the planters to be economical in the management of their plantations and in teaching them what can be done in that direction, with the result that, whereas three years ago it was thought impossible that sugar could be made profitably for 8s. 6d. per cwt., there are not wanting now planters who hope to bring the cost of its production down to as low as 1 c. per lb. Under the present conditions Cuba has little or nothing to fear from the competition of other countries in the production of sugar, whether cane or beet, and there is every reason to expect that, when the bounties on beet sugar are abolished she will regain the dominant position she formerly occupied in the world's markets, which she will have fairly won, thanks to the energy and tenacity of her planters.

FOREIGN CONSULAR REPORTS.

The German Government and German Trade.—Two reports recently sent out from the office of the United States Consul-General at Frankfurt set forth in some detail the efforts made by Germany, both by its diplomatic officials and its Consuls and commercial attachés, to promote trade with foreign countries. In the first it is narrated that the Minister of Commerce notified the various chambers of commerce throughout the Empire about the middle of 1901 that the German Legation in Morocco had asked the principal German firms in Tangier to prepare a collection of samples for the information of German manufacturers. It is explained that the Moorish demands for cottons had previously been supplied almost exclusively by England. These amounted, in 1899, to a value of 11,625,000 marks. The Minister was, therefore, convinced that it might be worth while for German manufacturers to try to compete with their English rivals. This collection of samples, when made, accompanied by a full explanatory report, was forwarded first to the Munich-Gladbach Chamber of Commerce for inspection by any manufacturers interested. Instructions were given that it was to remain upon exhibition there three weeks, after which it was forwarded to another chamber of commerce. Notice was given in each subsequent case in the newspapers that for a period of two weeks this collection of samples could be examined by interested persons residing within the district. The result was that a large number of representatives of different branches of the textile industry had an opportunity to make a careful inspection of the samples. Another experiment made by the German Government has been that of establishing a corps of commercial experts, whose members are detailed for duty at the consulates. Everything that has been gathered in a consular office as to trade methods is at once utilized by the expert, who, moreover, is not restricted in his movements by office duties. When his mission is completed, he returns to Germany for the purpose of meeting the interested exporters and giving them in detail individual instruction and information. This system is illustrated by a practical case. Dr. Quandt, the commercial expert attached to the consular office in Constantinople, undertook, during the year 1901 what is called an information journey through those German industrial districts interested in the export trade. Dr. Quandt was able to furnish much interesting information about the trade with Turkey, dealing especially with the reasons why it was difficult largely to increase Germany's trade relations, warning his hearers to be cautious in selling goods on credit, and recommending sources of information which might be deemed trustworthy.

Peat Development in Ontario.—Hundreds and thousands of dollars have been expended during the past few years in experiments by the different companies in the province for the perfection of machinery to turn out a fuel that will compete with coal. The Ellice Peat Company, successors to the Stratford

Peat Company, have added a new machine known as an artificial drier. Under the old process, the bog was cut and sun dried. With the new machine, the crude peat is run through the apparatus as fast as dug from the bog. Part of the moisture is evaporated by the heat of the process and the balance removed by the immense pressure the material undergoes, until it drops from the machine in cubes ready for the market. This process of converting the raw material into marketable fuel is a great improvement over the old method, but further improvements are expected. The whole question of making the inexhaustible beds of bog commercially valuable lies in the drying process. Thus far, the nearest solution to the problem lies probably in the machine invented by Dr. Dobson, now in use at his peat works at Beaverton, near Lake Simcoe, in northern Ontario. This machine consists of a press, drier, and spreader, and is a most ingenious contrivance, for it cuts, pulverizes, and spreads the material at the same time. This reduces the moisture 50 per cent., and the balance is taken out by the drying process. The machine in operation at this plant has a capacity of 20 tons a day. The bogs are three miles from a railroad, and yet the demand for the fuel is such that it brings \$3.25 a ton at the plant, and is retailed at Toronto at \$4.25. The plant near Stratford now has a daily capacity of 25 tons and a ready sale for all the fuel it can produce. It is run night and day, with a view to supplying the demand caused by the scarcity of hard coal.—*United States Consular Report.*

Openings for Steel and Iron in Greece.—The United States Consul at Patras reports as follows: "Enquiries have recently been made at this consulate concerning the possibility of importing American wire for the manufacture of wire nails. Before bringing the matter to the attention of United States manufacturers, I have taken occasion to enquire into the possibilities of such a trade in this section, and I find (1) that the market is sufficiently active to merit attention, and (2) that it is wholly dependent upon Europe for its supply of the raw material. The annual importation of steel wire into this district is about 2,000 tons, arriving principally during two months of the year, April and May, at which time there is extraordinary activity in the manufacture of boxes and barrels for the opening of the current trade in August of each year. Belgium gets the largest share of this trade, although Germany and Serbia are participants to some extent; the average price at which these countries export this wire being 20 francs (\$3.86) per 100 kilograms (220.46 pounds). In Patras there are three nail factories; in Piræus, three; and in Volo, one. There is also, I am told, a market for iron girders and beams for building purposes, bridges, etc., to the extent of 6,000 tons or more annually. Practically, the whole of this trade is controlled at present by Belgium, which has also been supplying large quantities of steel rails and construction iron for the extension of the Peloponnesus railroad to Calamata."

CHAMBERS OF COMMERCE REPORTS.

UNITED KINGDOM.

Dundee.—Harbour affairs, High School affairs, and the scarcity of clerks in London, formed the subjects around which important discussions took place at a meeting of the Dundee Chamber on the 6th ult. The president, Mr. A. B. Gilroy, occupied the chair.

Mr. Rudolph Polack was unable to give a very hopeful picture regarding the financial position of the High School, and made an appeal for financial aid from those who had benefited from their education at the High School.

Major W. H. Fergusson, one of the representatives at the Harbour Board, in giving a resumé of the work done, said the most pressing question before the Board at the present time was that of the new coal hoist. It had been erected at considerable expense, duly tested, and found to be capable of performing the work it was erected for. Unfortunately, however, when the railway companies had been asked to work the hoist, by sending coal to it, they had refused to do so.

Touching on the question of the importation of Canadian cattle, he said, in answer to a request by the Town Council, their representatives attended the London conference in October regarding the removal of the restrictions. The conference was most representative, and on the second day a large number of members of Parliament attended. Though they were unable to hold out strong hopes of anything being done at present, they were at one with the meeting in thinking the restrictions ought to be removed, and they were willing to act for that end. Referring to the resolution arrived at at the last meeting of the Board, fixing the hour for cartage of jute at 7.30 instead of eight o'clock, he said this would greatly add to the despatch with which vessels could be discharged, and would allow merchants to get their jute earlier.

The works and finances of the Harbour were in a most satisfactory condition. The president said there was an expenditure that the Harbour Board would have to incur in the near future, but which they were loth to commence on account of the expense. That was making permanent their present wooden jetties on the river frontage at which the jute vessels were discharged. They would admit that the plan adopted by the Trustees, who built these wooden piers some years ago, had proved of the greatest benefit to the Board. These jetties must only be regarded as temporary.

The action of marine growth eats away the piles, and in course of time these piles will have to be renewed, and the Trustees have under contemplation the erection of a sea wall outside the present jetties, and the enlargement of the sheds. The work can only be carried out in sections, but when completed a permanent wharf, with increased shed accommodation, will be available, and even greater facilities given to large steamers than at present. The wall may cost £80,000 before it is finished, but the expenditure must be faced, and it will likely involve an increase on the Harbour debt.

Hitherto the policy of the Trustees had been to keep the Harbour debt as low as possible. Up till now the Board had been successful in its endeavours not to increase it, and it was practically the same as it was about ten years ago. Were they to undertake such a large work he did not see how they could do it other than by adding to their present debt.

Referring to the matter of the coal hoist, he said he hoped in the near future the railway companies would see that it was as much to their advantage to work the hoist as it was to the Board to provide facilities for steamers obtaining coals.

A letter was read to the meeting from the Secretary of the Employment Department of the London Chamber of Commerce, stating that it was becoming increasingly evident that the demand in London for well-educated youths fresh from school was greatly in excess of the supply, and the Department would have no difficulty at present in securing appointments there for at least a dozen lads a week in addition to those now being placed in situations. Moreover, if a regular supply of such youths could be maintained there was little doubt that places could be found for a large number. Mr. C. B. Ovenstone said the rates in Dundee for beginners were £10, £15, and £20. He did not think there were too many young men in Dundee coming forward to become apprentice clerks, and he did not think it was

to the advantage of Dundee manufacturers to send the lads away. Ultimately it was agreed that the matter should be brought before the notice of the public.

Hull.—At the annual meeting of the Hull Chamber of Commerce and Shipping, on Wednesday, the question of the delay in construction of the new joint dock was discussed. The president, Mr. T. R. Forens, said increased dock facilities were absolutely necessary for Hull, as it was now 17 years since the last dock—the Alexandra Dock—was opened. Mr. Arthur Wilson complained of the action of that chamber and the city towards the promoters of the joint dock, and said he did not think the railway companies would object to the city's taking over the docks if terms could be arranged, but he scarcely thought the ratepayers would like to spend five or six millions on them. Alderman Massey opposed the arrangement between the two railway companies concerned. Mr. James Stuart thought the independence of the Hull and Barnsley Railway Company would be strengthened rather than prejudiced by the construction of the joint dock. Sir James Reckitt said the city had waited three years for a new dock, and they were no nearer its realisation. The question was, could they wait any longer? A dock trust, he considered, would be impracticable. No definite action was taken by the chamber.

Liverpool.—An important conference between the Committee of the African Trade Section of the Liverpool Chamber of Commerce and the Governor of the Gold Coast, Sir Matthew Nathan, K.C.M.G., was held, recently, in the Exchange Station Hotel, Liverpool, Sir Alfred Jones (chairman) presiding.

Sir Alfred Jones stated that the following subjects regarding the Gold Coast Colony would be discussed:—Trade of the colony, sanitation and water supply, railways, demarcation of boundaries in land concessions, and cotton-growing. He said that in regard to the first-named subject, as a result of the stoppage in the trade of arms and gunpowder, traders at French Ivory Coast ports were sending these articles to Ashanti, and were getting large quantities of rubber in exchange; whilst the Gold Coast merchants were losing their trade in rubber. With regard to the question of sanitation and water supply, Dr. Logan Taylor, of the Liverpool School of Tropical Medicine, visited the Gold Coast Colony in the spring of the year, and many suggestions for improving the health of Cape Coast Town have been reported upon by Sir Mathew Nathan. The water supply was chiefly rain water, and short and bad. Means to preserve such water from contagion in the tanks had been suggested, sources of additional supply had been indicated. Turning to railways, he said there was a great need for new lines to tap timber and agricultural as well as mining districts. The Sekondi Tarquah Railway extension to Kumasi should be hurried to completion, but the railways in mining districts should not be the only ones built. The committee had already recommended the construction of the proposed railway from Accra to Kpong.

Sir Matthew Nathan, in reply, observed that nearly everything was going on satisfactorily on the Gold Coast, although one branch of trade—the export trade—was not satisfactory. There was always fluctuation in the natural products of the country. One new industry that had been raising the hopes of the Government was cocoa. Ten years ago the export value of the article was nil; last year it was £40,000; and this year he hoped it would reach nearly £80,000, as it was coming down in great quantities to Accra. They must look for new products to export, such as cotton, but too much must not be expected. Cotton was an article which required a great amount of care in cultivation, and the native was not a careful cultivator.

In connection with cotton-growing Mr. Hutton stated that the movement in its favour was intended to be experimental at first. The great thing they wanted to find out was whether the long staple which commanded the highest price could be grown in the colony. If so, then there was an assured industry before it. They did not want to confine the efforts to the Gold Coast Colony, but hoped that experiments would be made in all the West African colonies.

Manchester.—At the quarterly meeting of the Manchester Chamber of Commerce on the 5th ult., Mr. J. Thomson, the president, gave his usual address. Dealing with the Chinese treaty, he said that many of our merchants were sceptical as to the probability that the stipulations for the abolition of *likin* would really be carried out. Their trade was chiefly with the northern part of China, where *likin* had been small or non-existent, and they did not consider that its abolition would be a sufficient equivalent for the proposed surtax. The heavy indemnity laid upon China was exercising a very depressing effect upon the price of silver, and had already raised the laying-down cost in dollars and taels of British and American piece-goods to an unprecedentedly high point. Referring to cotton cultivation, the British Cotton-growing Association was vigorously endeavouring to extend the growth of the plant on the West Coast of Africa and in the Eastern Sudan, where there was suitable soil and climate, a good supply of labour, and facilities for transport. In the West Indies, also, some stimulus might be given to the production of good quality. The progress of the port of Manchester during the last quarter had been exceedingly encouraging, and with the International Marine Association's steamers from Boston to Manchester their trade would be further increased. Sir W. H. Houldsworth, M.P., said that, with regard to the Patent Law Amendment Act, he should like to point out that it was a very great advance over the present system. Sir William said that, with regard to West African affairs, he did not consider Mr. Hulton was going too far in claiming that the Manchester Chamber had a right to ask for further information from the Colonial Office. There was a Minister of Commerce looming in the future, and there was no doubt the committee on commerce had instituted a discussion upon the subject.

Sir Charles King-Harman, Governor of Sierra Leone, on the 6th ult., met the members of the African section of the Manchester Chamber of Commerce and representatives of the British Cotton-growing Association in conference. He undertook to do his utmost to further the efforts which are being made to promote the cultivation of cotton in Sierra Leone, recognising that great good to the colony would probably result. Four needs had to be satisfied to make a satisfactory start—seed, capital, land, and labour. The first two, he supposed, the association would be willing to supply; he had already received a quantity of seed from Sir Alfred Jones last spring; this had been distributed in various parts of the Protectorate, and when he returned at the close of the present month he expected to learn the result of the experimental planting. As to the land necessary the Government would be answerable for that, and would seek the co-operation of the chiefs to obtain a proper supply of labour. He would endeavour to provide for the free transport of cotton by railway, at least until cotton could be raised and sold on a commercial basis. The Government would also be glad to take its full share in paying for the services of an expert upon whose services it must rely as to the best way of proceeding. The sooner that gentleman went out the sooner effective action could be taken. The Government of the Colony might further assist by remitting for a period some of the Customs duties on the machinery necessary for "ginning" and pressing the cotton. He would also see what could be done in the establishment of a system of prizes and

bonuses for the cultivation of the best and greatest quantity of cotton. Estates might be acquired, or the natives might be encouraged to grow cotton themselves. Land in the Protectorate belonged absolutely to the natives. A great deal could be done through the chiefs, and in many cases, with a little encouragement and help, the cultivation of cotton could be extended and undertaken much more systematically than it was at present. He would give his personal attention to it on his return. They were dealing with a race which was very suspicious of the white man, and the chiefs would not embark upon a speculative work until they could see their way to succeed in it.

Congress of Chambers of Commerce of the Empire.—Contrary to the usual practice, the fifth Congress of Chambers of Commerce of the Empire will be held in the colonies, the London Chamber of Commerce (the body responsible for the organisation of the congresses) having accepted the invitation of the Montreal Board of Trade to hold the fifth congress in that city in August, 1903. It is the intention of the Montreal Board to arrange for the free transportation of the delegates (who will represent the chambers of commerce from every part of the Empire) to various parts of the Dominion, in order that they may have an opportunity of becoming acquainted to some extent with its vast agricultural and mineral resources, its industrial development, and also with its requirements for the products of the mother-country and the Empire in general. In the meantime, the London Chamber is inviting many eminent men who are or have been intimately connected with the colonies to become honorary vice-presidents of the congress.

GENERAL INTELLIGENCE OF THE PAST MONTH.

November, 1902.

UNITED KINGDOM.

Nov. 1st:—The King arrived at Buckingham Palace from Newmarket. The Rev. C. Strange, Vicar of Edgbaston, was appointed Canon of Worcester Cathedral. Sir R. Finlay, Attorney-General, was elected Lord Rector of Edinburgh University. A demonstration took place at the Alexandra Palace to protest against the Education Bill. General De Wet left Southampton for the Cape. The Municipal Elections took place, the Liberals gaining 83 seats.

2nd: Mr. R. L. Morant, C.B., was appointed secretary to the Board of Education in place of Sir G. Kekewich, resigned. The Colonial Conference Blue Book was issued.

4th: The King inspected the 3rd Scots Guards returned from South Africa. Mr. W. Redmond was arrested at Kings-town. The 84th session of the Institution of Civil Engineers was inaugurated. Princess Christian opened new workhouse premises at Brentford.

5th: Mr. Chamberlain unveiled a memorial at University College School to old boys killed in South Africa. Lord Rosebery inspected the physiological laboratory at the London University. The Session of the Institute of Bankers was opened.

6th: The King left London for Sandringham. Col. C. Malcolm Fox was appointed Inspector of Physical Training under the Board of Education. Mr. H. Samuel (L.) was elected M.P. for the Cleveland Division of Yorkshire, and Mr. Austin Taylor (U.) for the East Toxteth Division of Liverpool.

7th: Lord Rosebery accepted the presidency of the Liberal Association at Epsom. A meeting of the Egypt Exploration Fund was held.

8th: Death of Sir James Graham-Montgomery. Death of Sir F. Perkins. The German Emperor arrived at Shorncliffe camp, inspected the 1st Royal Dragoons, and afterwards went to Sandringham. Alderman Sir Marcus Samuel was installed as Lord Mayor of London.

10th: Death of Sir A. Mackenzie, late Lieut.-Governor of Bengal. The Lord Mayor's banquet took place at the Guildhall. The elections of Mayors were held throughout the country. The King's birthday was celebrated in London.

11th: Mr. Chamberlain held a private interview with Generals Botha and Delarey.

12th: Lord Roberts was entertained at dinner by the Merchant Taylors' Company. A meeting of the National Service League was held at Oxford. Mr. James Guthrie was elected President of the Royal Scottish Academy. Sir J. Dimsdale was elected City Chamberlain.

13th: The Colston Banquet was held at Bristol. Princess Louise, Duchess of Argyll, opened the Queen Victoria Seamen's Rest at Poplar. Death of Mr. W. H. Barlow, F.R.S.

14th: A great meeting was held at the Albert-hall in support of the Education Bill. Mr. Choate, the U.S. Ambassador, unveiled a memorial window to Bishop Simpson in City-road Chapel.

15th: The German Emperor left Sandringham for Lowther Castle on a visit to Lord Lonsdale.

16th: Death of Prince Edward of Saxe Weimar. Death of Mr. G. A. Henty.

17th: The King left Sandringham for Windsor to meet the King of Portugal. The Prince of Wales left London for Market Weighton on a visit to Lord Lonsdale. Mr. Chamberlain was entertained at a farewell banquet in Birmingham. Death of the Rev. Hugh Price Hughes. Lord Wolverton was appointed Vice-Chamberlain of the Household.

18th: An appeal was issued by Lady E. Cecil on behalf of the Loyalists in South Africa. Death of Vice-Admiral G. H. Parkin.

19th: Sir Savile Crossley, M.P., was appointed Paymaster-General in the room of the Duke of Marlborough, resigned. Mr. John Redmond, M.P., arrived in Dublin. A meeting was held in aid of the endowment of King's College.

20th: The German Emperor left Lowther Castle, and after visiting Lord Rosebery at Dalmeny, embarked on board his yacht for Germany. A conference on the subject of municipal telephones was held in London.

21st: Sir E. Carson addressed a Conservative meeting at York. Death of Mr. R. M. Kerr, late Judge of the City of London Court. The Stanley Cycle Show was opened at the Agricultural-hall. The National Cycle and Motor Show was opened at the Crystal Palace.

22nd: Death of Sir William Roberts-Austen, Chemist and Assayer at the Royal Mint. The Lord-Lieutenant and Lady Dudley arrived in Belfast.

24th: The King and Queen left Windsor for Sandringham. The King of Portugal proceeded to Norfolk on a visit to Lord and Lady Amhurst. The Lord Lieutenant and Lady Dudley paid their first official visit to Belfast.

25th: Mr. and Mrs. Chamberlain left London for Portsmouth en route for South Africa. Mr. Cathcart Wason (I.L.) was elected M.P. for Orkney and Shetland. Lord Salisbury arrived in London from Beaulieu. The General Medical Council opened its winter session. A meeting of the British Cotton-growing Association was held at the Manchester Chamber of Commerce. Death of Colonel E. Hardy.

26th: A Royal Commission was appointed to enquire into the superannuation system in the Civil Service. Mr. Ritchie was the principal guest at the dinner of the Croydon Chamber of Commerce. The Duke of Cambridge presided at a meeting in connection with the International Fire Exhibition to be held next year at Earl's Court. Death of the Roman Catholic Archbishop of Tuam. Death of Sir W. Acland Lethbridge.

27th: The King of Portugal returned to London. Lord Reay was elected first President of the British Academy. The Thanksgiving-day Dinner of the American Society was held in London.

28th: The King of Portugal inspected the Oxfordshire Light Infantry. Sir H. Campbell Bannerman was the principal guest at the Cobden Club dinner. Mr. J. B. Bury was appointed Regius Professor of history at Cambridge University. Death of Dr. Joseph Parker.

29th: The Duke and Duchess of Connaught left London for Egypt and India.

COLONIES.

Australia.—7th: The Government sent congratulations to the Colonial Office on the completion of the Pacific cable.—21st: Lord Tennyson was appointed Governor-General of the Commonwealth for one year.—22nd: Negotiations were made with the Eastern Extension Telegraph Company for a general agreement, fixing rates and displacing the separate agreements with the several States. The title of Lord Mayor was conferred on the Mayors of Sydney and Melbourne.—24th: Sir E. Barton announced that a Defence Bill would be introduced during the next Parliamentary Session.—26th: Measures were taken to cope with the effects of the drought.

New Zealand.—12th: The Premier unveiled a cairn at Wellington to the memory of the late Sir John Mackenzie.—21st: The Rev. M. R. Neligan was nominated Bishop of Auckland.—25th: The general election resulted in a majority for the Government: the Ministers were all re-elected.

Canada.—3rd: A branch of the Navy League was constituted at Montreal.—4th: The British Columbia sealing season was the smallest on record.—18th: Sir Henry Strong resigned the Chief Justiceship of the Supreme Court, and was succeeded by Sir H. Taschereau.—21st: Mr. Dunsmuir retired from the Premiership of British Columbia in favour of Colonel Prior, Minister of Mines.—24th: A branch of the Navy League was formed at Ottawa.

Cape Colony.—1st: The House of Assembly voted £20,000 towards the erection in London of a national memorial to Queen Victoria.—3rd: Sir G. Sprigg's motion for the re-organisation of the Cape Colonial forces was defeated in the House of Assembly.—13th: The third reading of the Immigration Bill was passed.—14th: The South African League was re-organised. The House of Assembly adjourned for the session.—24th: The manifesto of the Progressives was well received in Cape Town.

Jamaica.—4th: The Legislative Council voted £20,000 to make advances to sugar estates.

Natal.—2nd: The Durban floating dock went ashore in Mossel Bay, on its way from the Tyne.—13th: Parliament was opened; the Governor announced the consideration of important railway questions.—17th: The Government was defeated on the question of the appointment of a Speaker in the room of Sir J. Hulett.—19th: Parliament was dissolved.

Orange River Colony.—19th: Martial law was repealed; the railway extensions were pushed on.—26th: Lord Milner visited Frankfort and Vrede.

St. Helena.—21st: Lieut.-Colonel H. L. Gallwey was appointed Governor in succession to the late Mr. K. A. Stern-dale.

Somaliland.—5th: The offer of a Boer contingent for service in Somaliland was declined. Colonel Swayne left for England, owing to ill-health.—11th: A flying column under Colonel Cobbe left Berbera.—17th: The column under General Manning and Colonel Cobbe arrived at Garrero.—19th: Bohotle was relieved and reinforced by General Manning. The flying column returned to Garrero.

Transvaal.—4th: The rent proclamation issued by Mr. Kruger at Johannesburg during the war was declared to be invalid.—8th: The Chamber of Mines at Johannesburg agreed to a higher rate of wages for natives.—12th: The forts at Pretoria were dismantled.—20th: Martial law was rescinded. Fifty thousand Boers were repatriated.—22nd: An ordinance was issued establishing a Land Department.—24th: Lord Milner left Johannesburg for a three-weeks' tour in the Orange River Colony.—27th: The Government announced that the Dutch language would be taught in schools.

INDIA.

6th: The number of persons in receipt of famine relief was reduced to 79,000. An expedition against the Kabeel-khel Waziris was ordered.—7th: The Viceroy concluded his tour in Central India, and commenced another in Rajputana.—13th: The number on famine relief was only 58,000.—17th: Four small flying columns were despatched to punish the Waziris.—22nd: The funeral of Sir John Woodburn, late Lieutenant-Governor of Bengal, took place at Calcutta.—28th: Lord Kitchener arrived at Bombay. At a state banquet at Jaipur the Maharajah expressed strong approval of the forthcoming Delhi Durbar.

FOREIGN COUNTRIES.

Argentine Republic.—22nd: A general strike began at Buenos Ayres, and serious disturbances took place.—24th: In consequence of labour troubles, a state of siege was declared in Buenos Ayres and Santa Fé.

Austria-Hungary.—2nd: Count Apponyi, President of the Hungarian Reichstag, issued a manifesto strongly condemning the nationality agitation in Hungary.—5th: The Provincial Diet of Lower Austria elections resulted in favour of the clericals.—24th: The Emperor's health improved.

Belgium.—12th: It was announced that the Count of Flanders had resigned all claims to the throne.—13th: The Chamber met and elected M. Schollaert as President.—15th: An anarchist attempted to shoot the King in Brussels.—17th: Mr. Keir Hardie, M.P., was arrested in Brussels.

Brazil.—7th: A new Cabinet was formed by Senhor Alves.—10th: The Bolivians were defeated in the Acre territory.—15th: Senhor Alves assumed the Presidency and issued a manifesto.

Bulgaria.—14th: The Cabinet resigned on account of personal differences.—17th: The Ministry was reconstructed with Dr. Daneff as Premier and Minister for Foreign Affairs.

Chili.—15th: The Ministry resigned.—19th: A new Cabinet was formed with Senhor Fernandez Albano as Minister of the Interior.

China.—1st: The officials responsible for the murder of two English missionaries at Hu-nan were punished.—5th: The Dowager Empress decided to construct a branch railway from the Peking-Han-Kau line to the Western Tonks.—17th: Frequent acts of piracy were reported between Hong Kong and

Canton.—20th: Sir E. Satow left Peking on six months' leave.—22nd: The evacuation of Shanghai commenced with the departure of the Japanese contingent.—24th: It was announced that Japan reserved the right to send troops again to Shanghai, should any other Power do so.—28th: The British troops received orders to evacuate Shanghai.

Colombia.—22nd: The civil war was ended. General Herrera agreed to terms of peace.

Egypt.—1st: Lord Kitchener and Sir R. Wingate visited the Assouan reservoir works.—4th: Lord Kitchener arrived at Khartoum.—8th: Lord Kitchener opened the Gordon College at Khartoum.—15th: The Khedive opened the new Museum of Antiquities at Cairo.

France.—4th: A duel was fought between M. Gérault Richard, a Socialist, and the Marquis de Dion, a Nationalist Deputy, 150 spectators being present.—7th: The Pas de Calais coal strike continued.—10th: M. Pelletan issued the Navy Estimates, amounting to 306,000,000 fr.—11th: The Miners' National Committee called for a general strike.—15th: The miners' strike was ended.

Germany.—2nd: Count von Bernstorff became First Secretary of the German Embassy in London in the room of Baron von Eckhardstein. A school of Art was opened at Charlottenburg by the German Emperor and Empress.—4th: The trust system was condemned in the Reichstag.—6th: The German Emperor left Kiel for England.—7th: Dr. Fischer was elected Archbishop of Cologne.—22nd: Death of Herr Friedrich Krupp, of Essen.—26th: The Emperor William was present at the funeral of Herr Krupp, at Essen.—27th: The German Emperor received the retiring American Ambassador, Mr. A. White, at the Royal Castle.

Holland.—7th: The ex-President of the Transvaal, Mr. Schalk Burger, arrived at the Hague.

Italy.—9th: Baron Sonnino stated that the condition of the southern provinces was deplorable.—19th: The Queen was delivered.

Morocco.—4th: Omar Zarahuné, the pretender, was defeated by the Sultan's troops.—13th: The Bonadir Kabyles caused disturbances near Tetuan.

Portuguese East Africa.—5th: M. Albert, general manager to the Delagoa Railways, was appointed railway adviser to the Central South African Railways at Lorenzo Marques.

Russia.—10th: M. Pobiedonostzeff tendered his resignation.—18th: Count Benekendorff was appointed ambassador at the Court of St. James's.—19th: A great fire occurred in the petroleum reservoirs near Odessa.

Servia.—18th: The Government resigned.—20th: A new Cabinet was formed, with General Zinzar Markovitch as Premier without portfolio, and General Pavlovitch as Minister of War.

Siam.—25th: It was reported that the rebels in the north of Siam had been dispersed, and that the country was settling down.—27th: The Siamese mint was closed to the free coinage of silver with a view to the establishment of a gold standard.

Spain.—10th: A Ministerial crisis occurred.—14th: A new Cabinet was formed by Señor Sagasta, with the Duke of Almodovar as Minister for Foreign Affairs.—21st: The Chamber rejected a vote of censure on the Government by 161 votes to 118.

Turkey.—10th: Death of Costaki Penthopoulos Pasha, Ambassador in London.—26th: The disturbances in Macedonia continued.

United States.—4th: A fatal explosion of fireworks occurred in New York.—5th: Mr. Odell, Republican, was elected Governor of New York State.—7th: The Reciprocity Treaty with Newfoundland was signed.—11th: The new building of the New York Chamber of Commerce was dedicated by President Roosevelt.—14th: A farewell dinner was given at New York to M. Cambon, the retiring French Ambassador.—26th: The negotiations with Colombia regarding the Panama Canal were at a deadlock. President Roosevelt received the members of Mr. Mosely's Labour Commission.—28th: The Press urged the Government to drop the Panama Canal and proceed with the Nicaragua project.

Venezuela.—6th: General Matos was reported to be near Cua with a strong force.—14th: The proclamation of blockade was held to be non-effective by the British Government.—24th: It was announced that the United States would not protect Venezuela or any other South American Republic in evading its obligations, and would remain absolutely neutral.—27th: Three German cruisers were ordered for service in Venezuelan waters.

A Portable Windmill.—Instead of using animal power in driving the various machines which are used on a farm, a western inventor, Mr. Amos Wallace, has conceived the idea of making the wind do his farm work for him. Stationary windmills are common enough, but a portable windmill is surely a novelty that merits more than passing notice. The contrivance is mounted on a low four-wheeled wagon which can be readily hauled to and from the field. On this wagon a stout framework is erected at each end. The upright frameworks are provided with bearings to receive the shafts of wind-wheels. The frameworks are stiffened and are securely supported by a system of braces. Each wind-wheel shaft carries a sprocket, connected by a chain with a small sprocket, journaled in a standard, which is carried in the centre of the wagon. The central sprocket shaft is fitted with a pulley which receives a driving belt. The belt can be slipped over the pulley of any farm machine which is intended to be driven.—*Scientific American.*

Artificial Marble in Denmark.—The lack of marble in Denmark has led to many attempts to produce a substitute which would equal in decorative effect the natural product and would not exceed it in cost. Some success has been achieved in the manufacture of this article in Sweden, but the thin slabs would not keep their shape, inclining to bend and warp. The veins were stiff and angular, and the soft transitions of colour which make variegated marble a thing of beauty were wanting. A significant advance has been made in this industry by a Danish master-builder, who is producing a stone of such delicate transition of tints and play of colour, that it is impossible to distinguish it from the natural product; while as to cost of manufacture, it can compete with all other artificial marbles. The imitation of the more expensive species does not exceed in cost that of the cheaper ones. The inconvenience hitherto met with, that the mass had to be greased to prevent adhesion (thereby destroying the crystalline surface characteristic of the genuine article), has been overcome. The process of manufacture is simple and easily learned, and the cost of the outfit does not exceed \$175. The article can be produced in any form desired—columns, plain or fluted, and capitals,—as readily as flat slabs. It is claimed that even pictures may be made of this material. It seems to have the durability of genuine marble, but its cost is only about one-tenth as much. At the present stage of the development of the industry, the maker is able to produce a slab about half-an-inch thick at a cost of 14 cents (7d.) per square foot.—*Scientific American.*

FORTHCOMING EVENTS.

UNITED KINGDOM.

Birmingham.—THE AGRICULTURAL SHOW opens on the 1st December (four days).—On the 13th inst., Mr. R. W. Hanbury, M. P., will attend the ANNUAL DINNER of the Birmingham Chamber of Commerce.—On the 16th, Lady Cadogan will open the IRISH INDUSTRIES ASSOCIATION ANNUAL SALE in the Birmingham Town Hall.

London.—On the 3rd inst. the MANSION-HOUSE COMMITTEE on the Port of London will meet. On the same date Lord Windsor will dine with the committee of the IMPERIAL SOUTH AFRICAN ASSOCIATION.—On the 8th inst. Dr. Sven Hedin will lecture at the Royal Geographical Society on "THREE YEARS' EXPLORATION IN CENTRAL ASIA."—On the 12th inst. the LONDON CHAMBER OF COMMERCE DINNER will be held.

FOREIGN COUNTRIES.

Belgium.—The ART EXHIBITION to be held in Brussels in 1903 will probably be opened at the beginning of September.

Brazil.—The Agricultural, Commercial and Industrial Society of Sao Paulo has decided to establish in that town a PERMANENT EXHIBITION OF AGRICULTURAL MACHINERY AND IMPLEMENTS, to include also motors and other apparatus for which alcohol is employed as the motive power. Brazil already produces a large quantity of alcohol, and is able to produce a still larger amount at a very cheap rate, whilst she does not rank as a producer of coal and oil. Motors and other apparatus utilizing this product should thus be assured of a great development in that country, more especially in the State of Sao Paulo, the richest and most important State of Brazil.

Greece.—A ROYAL INTERNATIONAL EXHIBITION, under the patronage of the Princess Royal of Greece, and assisted by the Greek Government, will be opened on April 3, 1903, at Athens. The exhibition, which will last for six months, will comprise the products of commerce and industry, hygiene, and alimentation, the fine arts and sciences, and education.

NAVAL AND MILITARY INTELLIGENCE.

NAVAL.

The *Bedford*, cruiser, completing for sea at Devonport, is to be ready for commissioning by April 1 next.

During the refit of the *Barfleur*, battleship, at Devonport, her armament of ten 4.7 in. quick-firing guns is to be replaced by ten 6 in. breech-loaders.

The *Hood*, battleship, which recently returned to Devonport from the Mediterranean Station, is to pay off on December 5 into D Division of the Dockyard Reserve.

The *Odin*, sloop, is ordered to be commissioned at Sheerness Dockyard on January 8 for service on the Cape of Good Hope and West Coast of Africa Station.

The *Flora*, cruiser, has been commissioned at Devonport with a crew of 318 officers and men, to relieve the *Phaeton*, cruiser, Captain E. J. Fleet, on the Pacific Station.

The *Hawke*, cruiser, is ordered to be commissioned at Chatham Dockyard on January 13 to convey relief crews to the Mediterranean for the *Pyramus*, cruiser, the *Speedy*, torpedo-gunboat, the *Dryad*, torpedo-gunboat, and the *Imogene*, special service vessel, which are to be commissioned for another term of service in the Mediterranean.

Experiments with oil fuel are to be made with the boilers of the *Bedford*, cruiser, at Devonport. The eight forward boilers will be fitted with apparatus for the use of liquid fuel, but these fittings will be so adjusted that they can be removed if the experiment is not successful. The *Arrogant*, cruiser, at Devonport, is also to be fitted with apparatus for similar experiments.

The *Falcon*, torpedo-boat-destroyer, was commissioned at Devonport on the 22nd ult. to take the place of the *Skate*, Lieut. and Commander R. M. Haynes, in the Instructional Flotilla. The *Skate* has developed rather serious defects since the beginning of the cruise ten days ago, and when off the Lizard last week shipped a heavy sea, which swept the upper deck and partially carried away the fore-bridge and twisted and strained other fittings.

The new first-class battleship *Venerable*, built at a cost exceeding £1,100,000, was commissioned at Chatham, on the 12th ult. by Captain George E. Patey, for service as the flagship of Rear-Admiral Reginald N. Custance, C.M.G., the newly appointed second in command of the Mediterranean Fleet. The *Venerable* is a battleship of 15,000 tons displacement, and is sister ship to the *Bulwark*, the flagship of Admiral Sir Compton E. Domville, Commander-in-Chief of the Mediterranean Station.

Orders were issued at Portsmouth on the 3rd ult. for the *Drake*, armoured cruiser, to be commissioned about the first week in January with a complement of 868 officers and men for service with the Cruiser Squadron, to relieve the *Junco*, cruiser, Captain D. Beatty, D.S.O. The *Drake* will be commissioned with the crew of the *Junco* on the day following that on which the latter vessel pays off into the Reserve, and such additions to the complement of the *Drake* as may be necessary will be drawn from the naval depot.

The *Merlin*, sloop, completed her 30 hours' coal-consumption trial at 3.14ths her maximum power, on the 4th ult., as follows:—Draught of water—forward, 10 ft. 11½ in.; aft, 11 ft. 6 in.; pressure of steam at boilers, 186 lb.; ditto at engine, 175 lb.; vacuum—starboard, 27.1 ins.; port, 27.3 ins.; revolutions—starboard, 119.5 per minute; port, 118.9; mean pressure in cylinders—starboard, high, 35.4; intermediate, 16.5; low, 4.8; port, high, 38.3; intermediate, 13.3; low, 5.4; aggregate i.h.p., starboard and port, 329; coal consumption, 1.81 lb. per i.h.p. per hour; speed, 8.8 knots. The *Merlin* is fitted with engines of a maximum of 1,400 i.h.p., made in Sheerness Dockyard; her water-tube boilers are of the Belleville type, and were made in Devonport Dockyard.

The Admiralty has called for tenders for a first-class armoured cruiser of 13,000 tons. The cruiser will be a sister ship to one to be built at Pembroke Dock, and will represent an entirely new type, being a central battleship with all her big guns placed within a citadel instead of each within a casemate, as in recent cruisers. A great increase is to be made in the gun power, several 9.2 in. weapons being fitted. Something will be lost in speed, the rate anticipated being twenty-two knots, which will necessitate machinery of between 23,000 and 24,000 indicated horse-power. Although previous cruisers placed steamed twenty-three knots, these latest vessels will be able to take their places against the new type of high-speed battleships with only 10-in. guns.

The 19 torpedo-boat-destroyers now building are to be fitted with small tube water-tube boilers of the following types:—Five boats building at the yard of Messrs. Palmer, Jarrow-on-Tyne—the *Exe*, *Eltrick*, *Erne*, *Cherwell*, and *Dee*—with Reed boilers. Four boats building at the yard of Messrs. Jarrow, Poplar—the *Ribble*, *Usk*, *Teviot*, and *Welland*—with Yarrow boilers. Four boats building at the yard of Messrs. Laird,

Birkenhead—the *Itchen*, *Foyle*, *Arun*, and *Blackwater*—with Laird-Normand boilers. Three boats building at the yard of Messrs. Hawthorne, Leslie, and Co., Newcastle—the *Derwent*, *Eden*, and *Waveney*—with modified Yarrow boilers. Two boats building at the yard of Messrs. Thornycroft, Chiswick—the *Kennet* and *Jed*—with Thornycroft boilers. One boat building at the yard of the Parsons Steam Turbine Company—the *Velox*—with modified Yarrow boilers. Nine torpedo-boats are in course of construction, and of these five, building at the yard of Messrs. Thornycroft at Chiswick, will be fitted with Thornycroft boilers; four building at the yard of Messrs. White, of Cowes, will be fitted with White-Forster boilers. Two third-class cruisers are in hand; one, the *Ametyst*, building at Elswick, is to have her machinery fitted by the Parsons Turbine Company, and with modified Yarrow boilers; the other, the *Topaze*, is building at Birkenhead, and will be fitted with boilers of the Laird-Normand type.

France.—The *Patrie* states that the French Mediterranean squadron in reserve, consisting of the battleships *Brennus*, *Masséna*, *Carnot*, *Hoche*, *Charles Martel*, and *Lahire* left Toulon in order to practise evolutions, gun and musketry fire, and discharge of torpedoes, returning at the end of the following week. The crews have been completed from those belonging to the active squadron. The same journal states that the French Minister of Marine has given instructions to the Forges et Chantiers de la Méditerranée at Toulon to cease work on the building of the new battleship *Justice* and also to warn the manufacturers not to give further orders in connection with the supply of material. Instructions have also been received at the Loire to cease all preparations for the building of the battleships *Liberté*, *Vérité*, and *Démocratie*.

Germany.—*Ueberall* states that a new division of German deep-sea torpedo-boats building by Schichau at Elbing is so far advanced that the first boat will be shortly commissioned. The new boats will be numbered S114 to S119. Yet another division is to be put in hand next year, the building and cost of which will extend into 1904.

Russia.—The Ministry of Marine is about to lay down in the shipbuilding yard on the Galley Island in St. Petersburg the keel of an armoured cruiser which is to be much greater than any cruiser now in the Russian navy; the displacement will be 16,000 tons. So far Great Britain is the only power which possesses vessels of this immense size. The new cruiser is to be quite ready for sea in three years. A striking feature of its construction will be that while the vessel is on the stocks the material and component parts necessary for building a second cruiser on exactly the same lines will be prepared, so that when the first cruiser is launched the second cruiser can be taken in hand at once. This system of building vessels of a similar type shortens considerably the time otherwise occupied in the construction of the second vessel, and it has been tried already with success in the Baltic shipbuilding yard on the Neva.

The *France Militaire* states that the official trials of the Russian armoured cruiser *Bayan* took place at Toulon on October 28. In accordance with the contract the speed attained was 21 knots, the engines developing 17,400 horse-power and making 577 revolutions per minute. The trials were considered satisfactory.

United States.—The Naval Board of Construction, after long discussion, has adopted the general features to be embodied in two armoured cruisers authorised by Congress two years ago. There was a division of opinion between the advocates of speed and armament. Rear-Admiral Bowles, chief constructor, Rear-Admiral O'Neil, chief of the Bureau of Ordnance, and Captain Sigsbee, chief intelligence officer, were in favour of very heavy armament and armour which, upon the authorised displacement of 14,500 tons, would allow a narrow margin of horse-power to obtain a speed of 22 knots, while Rear-Admiral Melville, engineer-in-chief, and Rear-Admiral Bradford, chief of the Bureau of Equipment, were in favour of higher speed and lighter armour and armament. When a vote was taken, Admiral Bradford joined the majority of his colleagues, whose wishes are to be carried out in the designs. There will be great weight and thickness in the armoured deck (4½ in.) and bulkheads as compared with previous cruisers, and the side-armour (6 in.), will enable them to "lie in a line" with battleships. Indeed, Rear-Admiral Melville says: "They are not armoured cruisers, but battleships, and they will not be the vessels Congress intended to be constructed." Upon this subject he has presented a report, expressing the view that 22 knots is not adequate for modern cruisers.

MILITARY.

The Crown Prince of Siam has joined the School of Military Engineering, Chatham, for a course of instruction.

Major-General H. C. O. Plumer, C.B., is to retain command of a Brigade of the 1st Army Corps on promotion.

Surgeon-General A. S. Reid has been awarded the good service pension vacant by the death of Surgeon-General R. Harvey, C.B., Indian Medical Service.

Colonel E. T. Dickson has arrived at Barbados and has taken over command of the troops in the West Indies, with the rank and status of Colonel on the Staff.

The Duke of Connaught has selected Lieut.-Colonel Congreve, V.C., Rifle Brigade, for Assistant Military Secretary and Aide-de-Camp on his Staff of the 3rd Army Corps.

Major H. C. Lowther, D.S.O., 1st Scots Guards, who has the medal with six clasps for South African service, has been appointed a Brigade Major in the 1st Army Corps.

Lieut-General Sir George Luck, having left India for England, Major-General D. J. S. McLeod, C.B., has assumed command of the Bengal Army, with the temporary rank of Lieut-General.

Major-General Sir Reginald Hart, V.C., R.E., on relief in the Quetta command by Major-General Sir Alfred Gaselee, will revert to the rank of Colonel, and is under orders to proceed to England to await re-employment.

Lieut.-Colonel Sir John Jervis-White-Jervis has been appointed to the command of the 47th Brigade Division, R.F.A., at Colchester, on promotion from Z Battery R.H.A., in Ireland.

Colonel C. H. Collette, half-pay, lately commanding the 1st Battalion Shropshire Light Infantry, has taken over from November 1 the command of the 53rd Regimental District at Shrewsbury, vice Colonel F. W. Robinson, whose five years have expired.

Lieut.-Colonel C. B. Vyvyan has vacated his staff appointment as Assistant Adjutant-General in South Africa and proceeded to India, by orders from home, to take over command of the 1st Battalion East Kent Regiment, to which he was lately appointed, vice Lieut.-Colonel B. F. Holme, deceased.

Colonel J. Grove White, on vacating command of the 1st Battalion Middlesex Regiment in India, has been selected for employment on the Staff, and joins the 1st Army Corps at Aldershot as A.Q.M.G. of the 2nd Division, under Major-General C. W. H. Douglas.

Lieut.-Colonel H. A. Walsh, on the completion of his term of command of the 1st Battalion Somersetshire L.I. in India, is about to be gazetted to the command of the 20th Regimental District at Bury, vacant by the retirement of Colonel R. Brunner-Randall.

The appointment of Accountant-General at Indian Army headquarters has become vacant by the retirement of Colonel J. A. Miley, C.S.I., Indian Staff Corps, who has held the position since November, 1893. Col. Miley was placed on the unemployed supernumerary list on the 30th ult.

Brevet Lieut.-Colonel H. F. M. Wilson, second in command of the 4th Battalion Rifle Brigade, in South Africa, has been selected for the command of the 2nd Battalion, in Egypt, vice Colonel C. T. E. Metcalfe, who has taken over command of the troops in Mauritius.

The 2nd Battalion Royal Sussex Regiment, after more than 20 years' foreign service, has left India for England, having been relieved by its 1st Battalion from South Africa. Sir Edward Wheler, who has been second in command of the 2nd Battalion since October, 1898, has now taken over command of the 1st Battalion.

Brigadier-General H. P. Leach, C.B. R.E., who has been at home on leave, has left for India, and on arrival at Bombay will proceed to Calcutta, where he will relieve Brigadier-General C. R. Townley, who has been officiating in command of the Residency District. General Townley will then return home.

Major W. C. Neville having been ordered to rejoin his battalion, the 2nd Cheshire, on its return from active service in South Africa, Brevet Lieut.-Colonel J. G. Wolrige-Gordon, 1st Battalion Argyll and Sutherland Highlanders, has been selected to succeed him in command of the 5th Provisional Battalion at Devonport.

Brevet Lieut.-Colonel H. de B. de Lisle, C.B., D.S.O., 5th Dragoon Guards, has been appointed to succeed Lieut.-Colonel F. J. P. Butler, Reserve of Officers, in command of the 2nd Provisional Regiment of Hussars at Hounslow, and Major A. Hughes-Onslow, 10th Hussars, is to take command of the 4th Provisional Regiment of Dragoons at Aldershot, in place of Lieut.-Colonel W. C. Middleton, Scots Greys, who is to rejoin the latter.

A couple of new Vickers-Maxim jointed one-pounder automatic quick-firing guns, with pack transport, have been ordered by the Government of India, and will be submitted this cold season to an exhaustive trial in hill operations, with a view to their immediate adoption, provided they fulfil the conditions of service and possess the merit claimed for them. It was hoped that the guns would be ready for use during the Delhi manoeuvres, but this was impossible, so they will be experimented with independently.

The *France Militaire* states that the French army Budget for 1903 allows £25,862,500 for the home army, against £25,537,602 in 1902; £1,135,000 for the colonial army, against £1,116,233 in 1902; and £1,442,500 for extraordinary expenses, against £1,965,459 in 1902; the increase in the allowance for the home and colonial armies being more than counter-balanced by the decrease in the extraordinary expenses. The total army Budget for 1903 amounts to £28,440,000, against £28,619,294 in 1902.

An officer in the Danish Army has invented a machine-gun which is not much larger or heavier than an ordinary rifle. It presents the acme of portability, so that—especially in close or mountainous country—it offers great advantages over the machine gun proper, with its wheels and teams of horses, mules, or men. The gun can be used as an ordinary rifle where there is a rest for it, and a small folding support can also be made use of. If mounted, the soldier is easily able to carry the gun, tripod, and a thousand rounds of ammunition. The possibilities open to a mounted infantry corps with a third or quarter of its number carrying these machine rifles and the remainder carrying ammunition are infinite. For defensive purposes the new invention has much to recommend it. The new weapon weighs only about thirteen pounds, and can be fired at the rate of 300 rounds a minute, or at a slower speed if requisite. The trials with the new weapon are stated to have been most successful, and it has now been formally adopted by the Danish army.

METRICAL WEIGHTS AND MEASURES.

TABLES FOR CONVERTING METRICAL WEIGHTS AND MEASURES.

HECTARE.	ACRE.	KILO-MÈTRE.	ENG. MILE.	SQUARE KILO-MÈTRE.	ENG. MILE.
0.405	1	2.471	1.609	1.621	2.592
0.809	2	4.942	3.219	3.242	5.184
1.214	3	7.413	4.828	4.864	7.776
1.619	4	9.885	6.438	6.486	10.368
2.023	5	12.356	8.047	8.107	12.960
2.428	6	14.827	9.656	9.728	15.552
2.833	7	17.298	11.265	11.349	18.144
3.237	8	19.769	12.875	12.971	20.736
3.642	9	22.240	14.484	14.592	23.328
4.047	10	24.711	16.093	16.214	25.920
4.452	11	27.182	17.702	17.840	28.512
4.857	12	29.653	19.311	19.461	31.104
5.262	13	32.124	20.920	21.082	33.696
5.667	14	34.595	22.529	22.703	36.288
6.072	15	37.066	24.138	24.324	38.880
6.477	16	39.537	25.747	25.945	41.472
6.882	17	42.008	27.356	27.566	44.064
7.287	18	44.479	28.965	29.187	46.656
7.692	19	46.950	30.574	30.808	49.248
8.097	20	49.421	32.183	32.429	51.840
8.502	21	51.892	33.792	34.050	54.432
8.907	22	54.363	35.401	35.671	57.024
9.312	23	56.834	37.010	37.292	59.616
9.717	24	59.305	38.619	38.913	62.208
10.122	25	61.776	40.228	40.534	64.800
10.527	26	64.247	41.837	42.155	67.392
10.932	27	66.718	43.446	43.776	70.000
11.337	28	69.189	45.055	45.397	72.592
11.742	29	71.660	46.664	47.018	75.184
12.147	30	74.131	48.273	48.639	77.776
12.552	31	76.602	49.882	50.260	80.368
12.957	32	79.073	51.491	51.881	82.960
13.362	33	81.544	53.100	53.502	85.552
13.767	34	84.015	54.709	55.123	88.144
14.172	35	86.486	56.318	56.744	90.736
14.577	36	88.957	57.927	58.365	93.328
14.982	37	91.428	59.536	59.986	95.920
15.387	38	93.899	61.145	61.607	98.512
15.792	39	96.370	62.754	63.228	101.104
16.197	40	98.841	64.363	64.849	103.696
16.602	41	101.312	65.972	66.470	106.288
17.007	42	103.783	67.581	68.091	108.880
17.412	43	106.254	69.190	69.712	111.472
17.817	44	108.725	70.799	71.333	114.064
18.222	45	111.196	72.408	72.954	116.656
18.627	46	113.667	74.017	74.575	119.248
19.032	47	116.138	75.626	76.196	121.840
19.437	48	118.609	77.235	77.817	124.432
19.842	49	121.080	78.844	79.438	127.024
20.247	50	123.551	80.453	81.059	129.616
20.652	51	126.022	82.062	82.680	132.208
21.057	52	128.493	83.671	84.301	134.800
21.462	53	130.964	85.280	85.922	137.392
21.867	54	133.435	86.889	87.543	140.000
22.272	55	135.906	88.498	89.164	142.592
22.677	56	138.377	90.107	90.785	145.184
23.082	57	140.848	91.716	92.406	147.776
23.487	58	143.319	93.325	94.027	150.368
23.892	59	145.790	94.934	95.648	152.960
24.297	60	148.261	96.543	97.269	155.552
24.702	61	150.732	98.152	98.890	158.144
25.107	62	153.203	99.761	100.511	160.736
25.512	63	155.674	101.370	102.132	163.328
25.917	64	158.145	102.979	103.753	165.920
26.322	65	160.616	104.588	105.374	168.512
26.727	66	163.087	106.197	106.995	171.104
27.132	67	165.558	107.806	108.616	173.696
27.537	68	168.029	109.415	110.237	176.288
27.942	69	170.500	111.024	111.858	178.880
28.347	70	172.971	112.633	113.479	181.472
28.752	71	175.442	114.242	115.100	184.064
29.157	72	177.913	115.851	116.721	186.656
29.562	73	180.384	117.460	118.342	189.248
29.967	74	182.855	119.069	119.963	191.840
30.372	75	185.326	120.678	121.584	194.432
30.777	76	187.797	122.287	123.205	197.024
31.182	77	190.268	123.896	124.826	200.000
31.587	78	192.739	125.505	126.447	202.592
31.992	79	195.210	127.114	128.068	205.184
32.397	80	197.681	128.723	129.689	207.776
32.802	81	200.152	130.332	131.310	210.368
33.207	82	202.623	131.941	132.931	212.960
33.612	83	205.094	133.550	134.552	215.552
34.017	84	207.565	135.159	136.173	218.144
34.422	85	210.036	136.768	137.794	220.736
34.827	86	212.507	138.377	139.415	223.328
35.232	87	214.978	140.000	141.036	225.920
35.637	88	217.449	141.609	142.657	228.512
36.042	89	219.920	143.218	144.278	231.104
36.447	90	222.391	144.827	145.899	233.696
36.852	91	224.862	146.436	147.520	236.288
37.257	92	227.333	148.045	149.141	238.880
37.662	93	229.804	149.654	150.762	241.472
38.067	94	232.275	151.263	152.383	244.064
38.472	95	234.746	152.872	154.004	246.656
38.877	96	237.217	154.481	155.625	249.248
39.282	97	239.688	156.090	157.246	251.840
39.687	98	242.159	157.699	158.867	254.432
40.092	99	244.630	159.308	160.488	257.024
40.497	100	247.101	160.917	162.109	259.616

MÈTRE.	YARD.	KILO-GRAMME.	LB. AVOIR.	LITRE.	GAL- LONS.
0.914	1	0.454	1	0.22	0.004
1.829	2	0.907	2	0.44	0.008
2.743	3	1.361	3	0.66	0.012
3.658	4	1.814	4	0.88	0.016
4.572	5	2.268	5	1.10	0.020
5.486	6	2.722	6	1.32	0.024
6.401	7	3.175	7	1.54	0.028
7.315	8	3.629	8	1.76	0.032
8.229	9	4.082	9	1.98	0.036
9.144	10	4.536	10	2.20	0.040
10.058	11	4.989	11	2.42	0.044
10.973	12	5.443	12	2.64	0.048
11.887	13	5.896	13	2.86	0.052
12.802	14	6.350	14	3.08	0.056
13.716	15	6.803	15	3.30	0.060
14.631	16	7.257	16	3.52	0.064
15.545	17	7.710	17	3.74	0.068
16.460	18	8.164	18	3.96	0.072
17.374	19	8.617	19	4.18	0.076

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